INC

JAA52851-R.3724.A

作成承認印	配布許可印
ニコン映像カンパニー 品質保証部 GM	サービス 計画課 M

AF-S Nikkor 400mm f/2.8G VR ED

JAA52851

REPAIR MANUAL

Nikon | NIKON CORPORATION
Tokyo, Japan

Printed in Japan November 2007

※ Before Disassembly / Reassembly / Adjustment

This lens also has the VR (vibration-reduction) unit mounted in order to correct camera shake.
To keep the accuracy of this function for stabilizing the image, in case the gyro FPC, main PCB, or the VR unit-assy is replaced, be sure to make the VR adjustment by using the VR lens adjustment equipment (J15380). However, except for disassembling the above components, the VR adjustment is NOT necessary, so at repair service facilities where the "VR lens adjustment equipment" is not prepared, do NOT disassemble NOR repair the products of the above cases.

Caution:

- **When disassembling/(re)assembling, be sure to use the conductive mat (J5033) and wrist strap (J5033-5) for static protection of electrical parts.**
- **When disassembling, make sure to memorize the processing state of wires, screws to be fixed and their types, etc.**
- **Because prototypes are used for "1. Disassembly" and "2. Assembly/Adjustment", they may differ from the actual products in forms, etc.**
- **Because pictures are processed by a special method, they may differ from the actual ones in texture.**

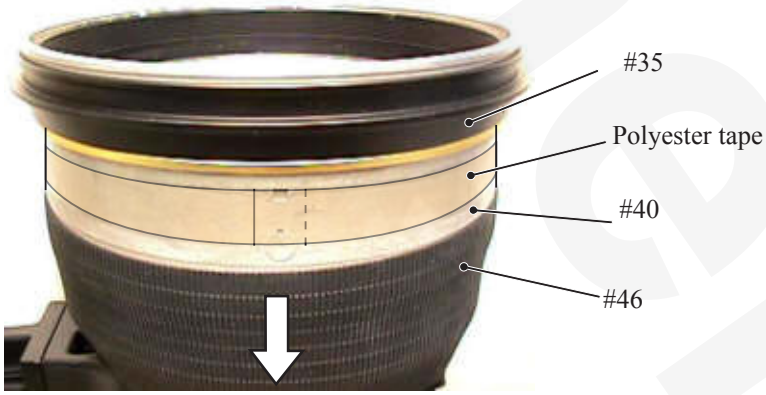
Points to notice for Lead-free solder products
・Lead-free solder is used for this product. ・For soldering work, the special solder and soldering iron are required. ・Do NOT mix up lead-free solder with traditional solder. ・Use the special soldering iron respectively for lead-free solder and lead solder. They cannot be used in common.

1. Disassembly

Name plate

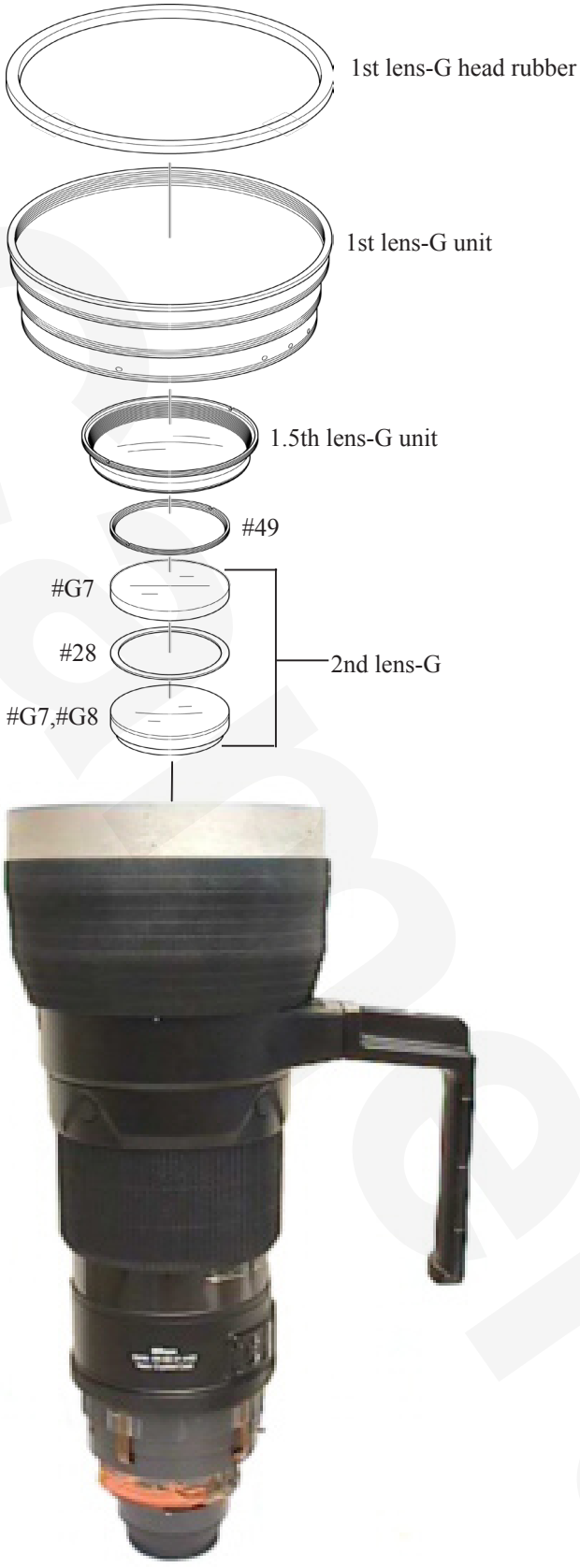
Polyester tape

・Pull down the rubber ring (#46), then peel off the polyester tape that covers around the lens housing (#40) and the front fixed tube (#35).

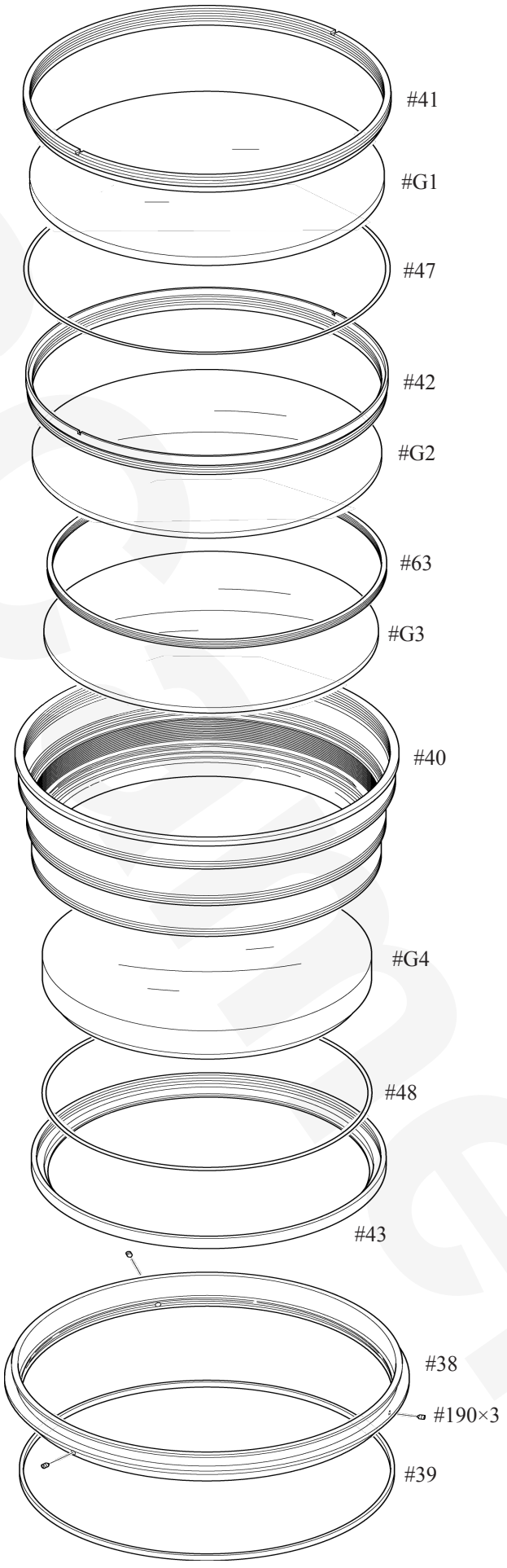


2nd lens group, 1.5th lens-G unit, 1st lens-G unit

- Remove the 1st lens-G head rubber and 1st lens-G unit.
- Remove the 1.5th lens-G unit with the wrench (J11350).
- Fasten the focus drive section with the focus fixing pin. Then, detach the retaining ring (#49) with a wrench (J11351), and remove the 2nd lens group. Refer to Page 37 for how to fasten with the focus fixing pin.

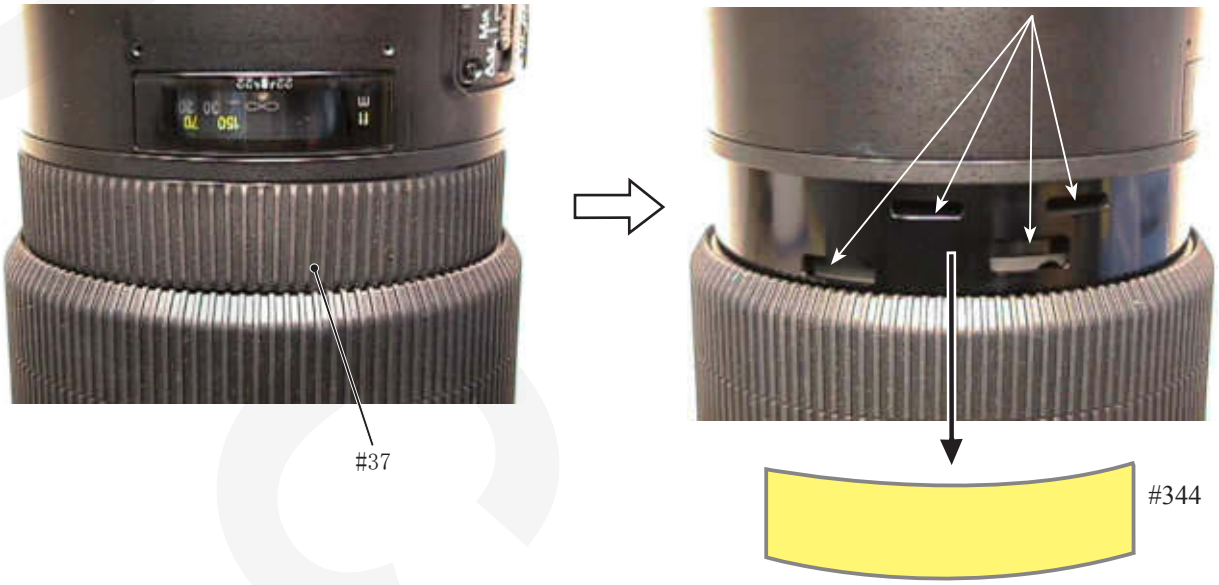


1st lens-G unit



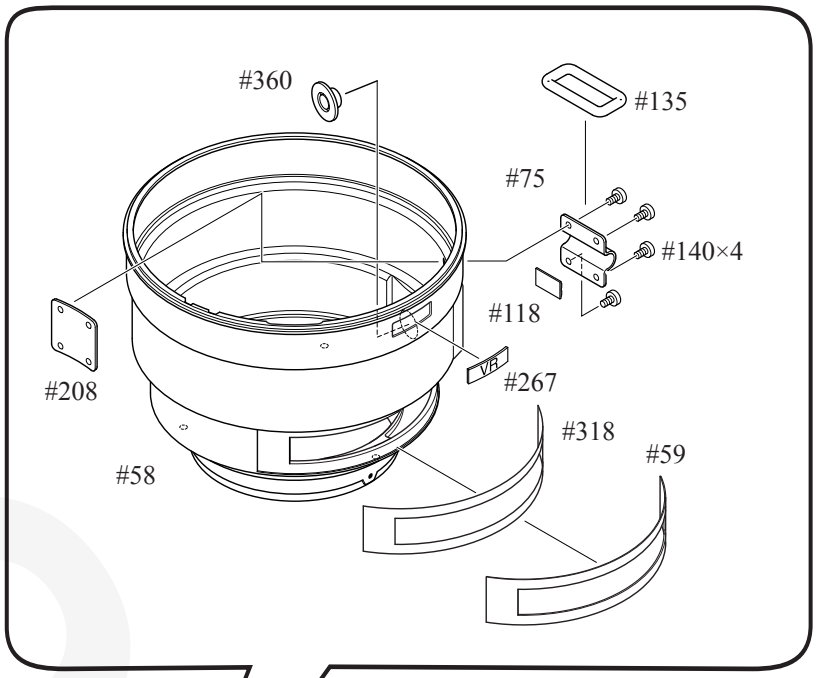
MF ring small rubber

・Remove the MF ring small rubber (#37), and peel off the tape (#344) that covers the four holes of the MF ring unit.



Insertion filter

Exterior fixed tube unit



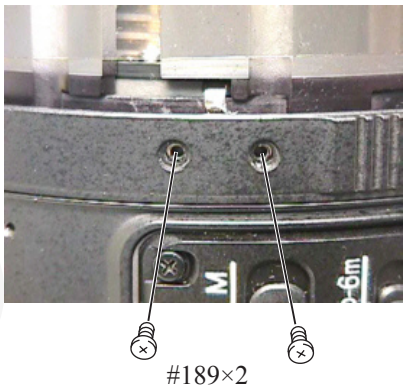
#112×3

Exterior fixed tube unit

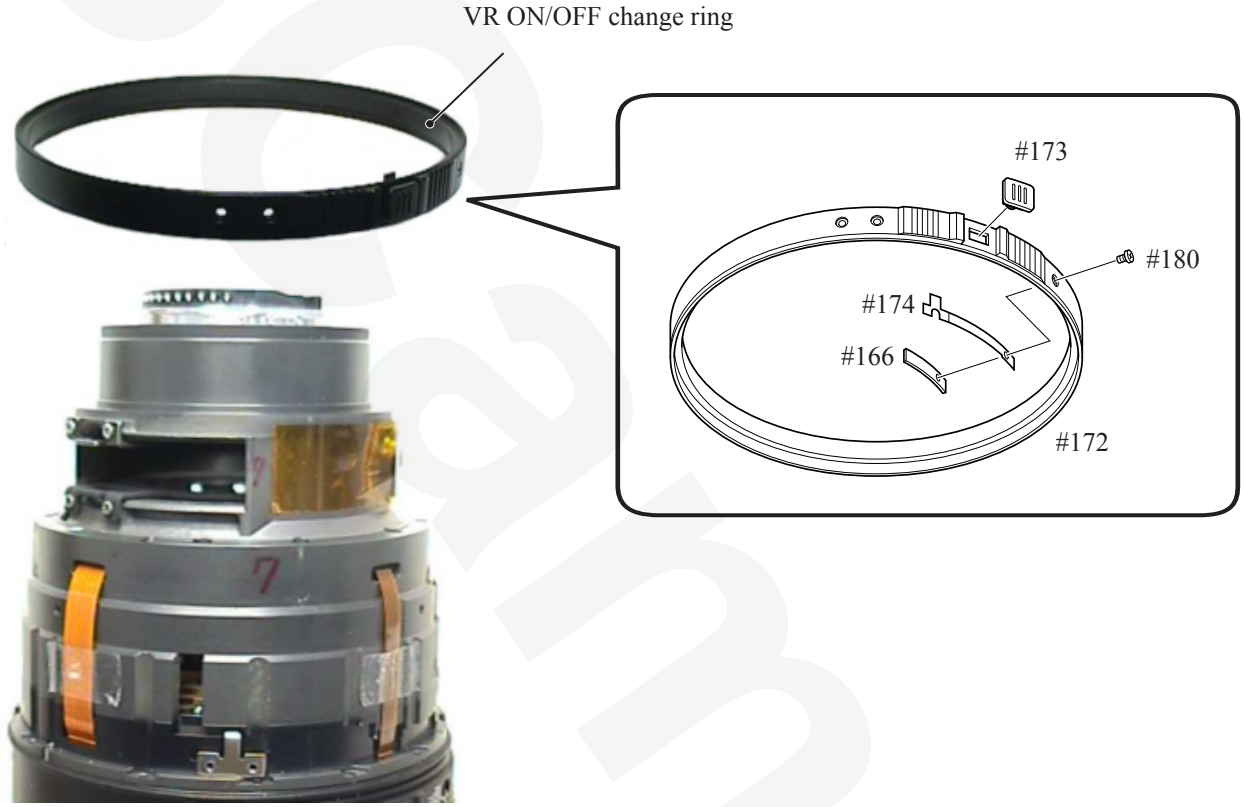
Tripod base

VR ON/OFF change ring

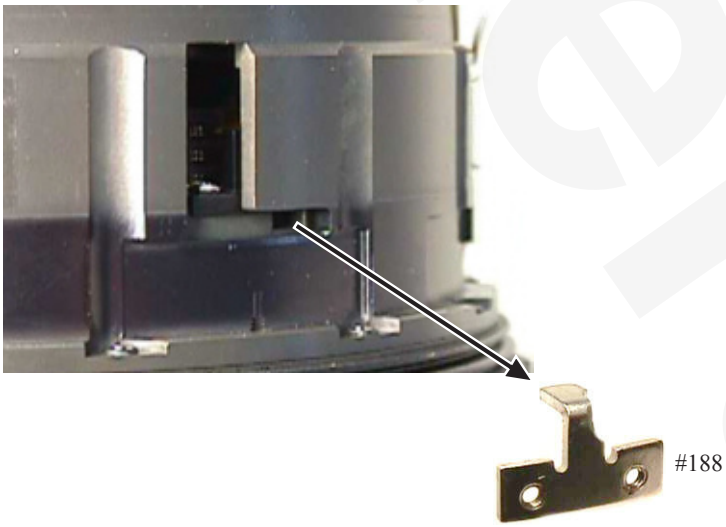
・Take out the two screws (#189) from the VR ON/OFF change ring.



・Disassemble VR ON/OFF change ring.

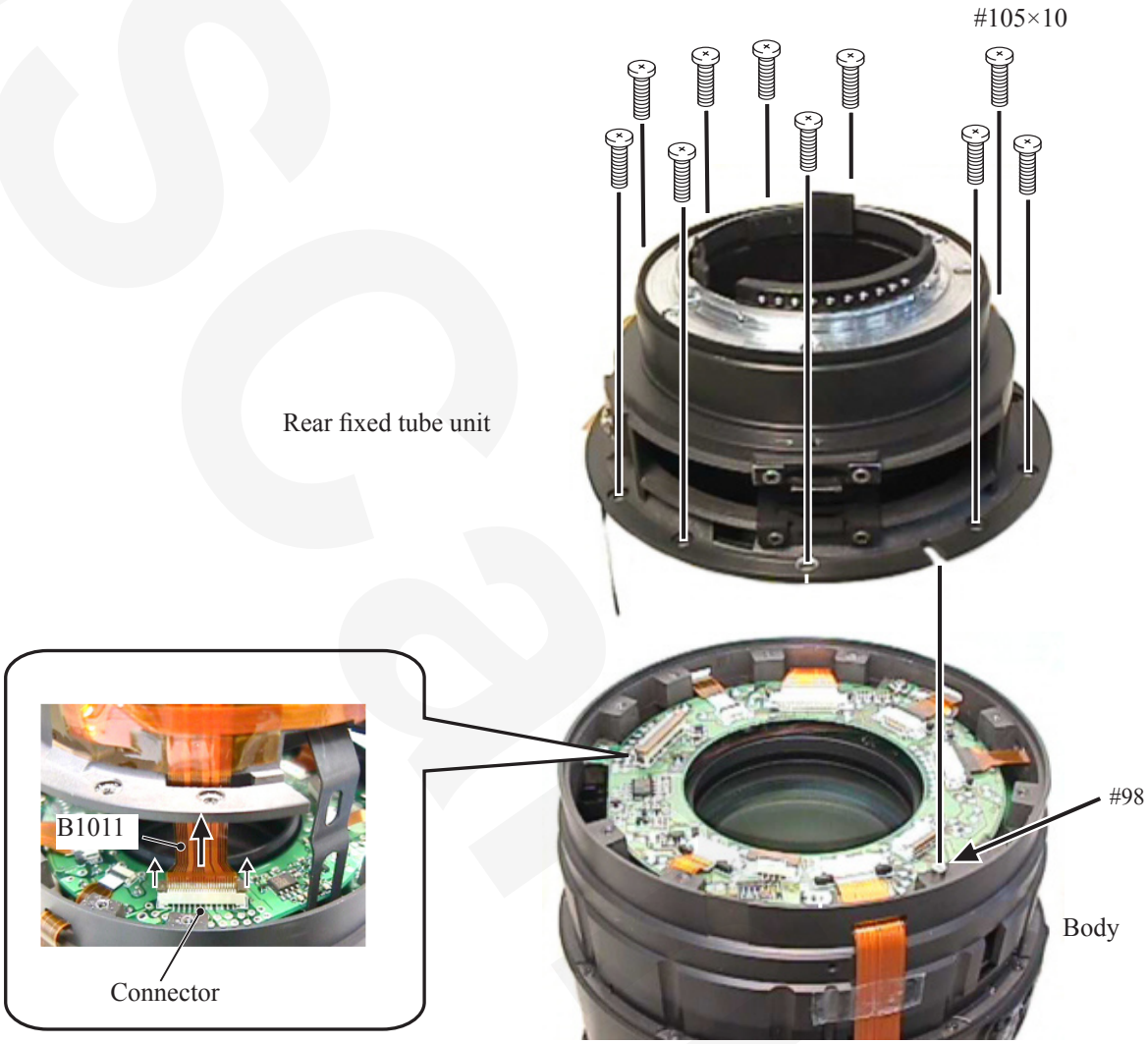


・Remove the VR lock coupling key (#188) from the hole of the VR unit-assy.

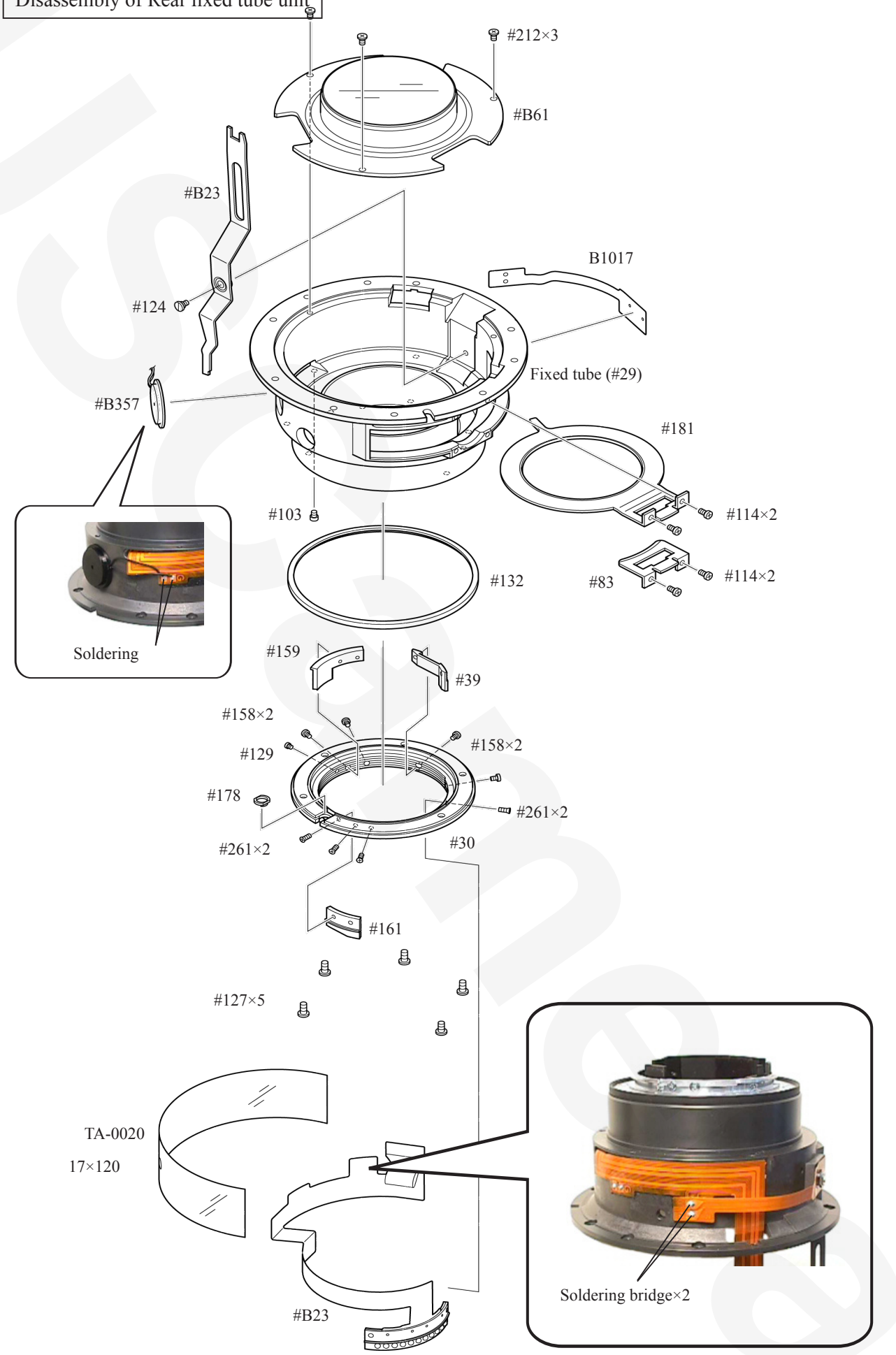


Rear fixed tube unit

- Take out the ten screws (#105) from the fixed tube unit.
- Lift the rear fixed tube unit slowly, and disconnect the FPC (B1011) from the connector.

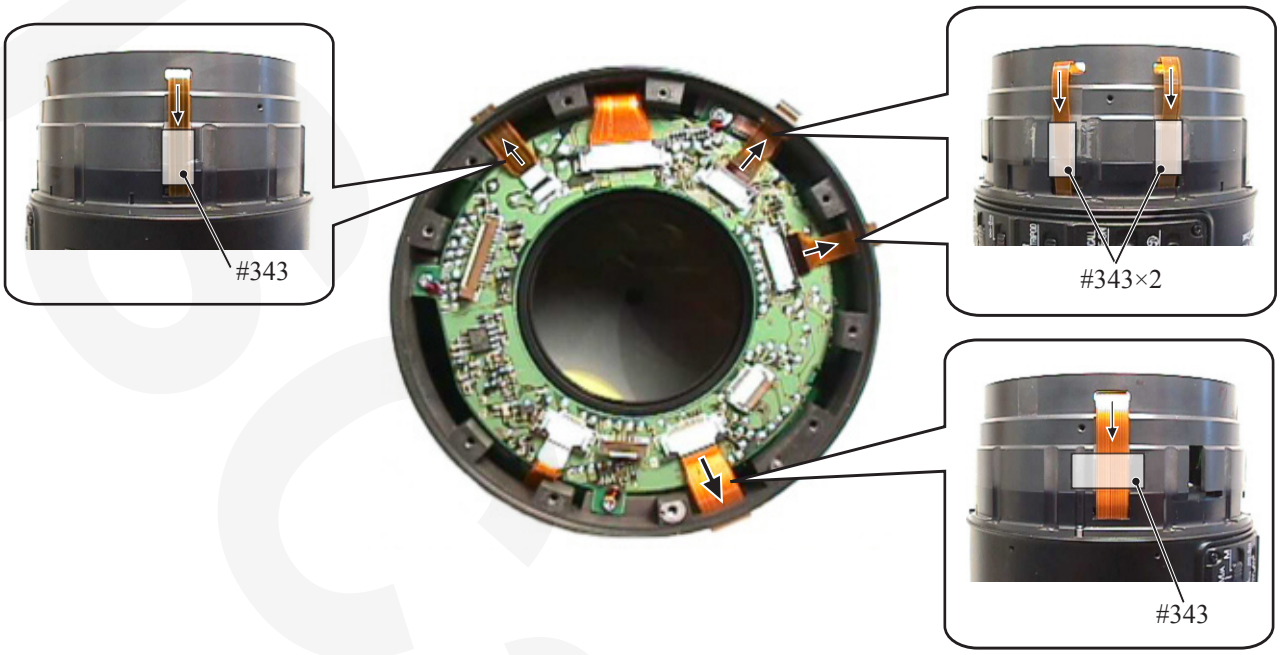


Disassembly of Rear fixed tube unit

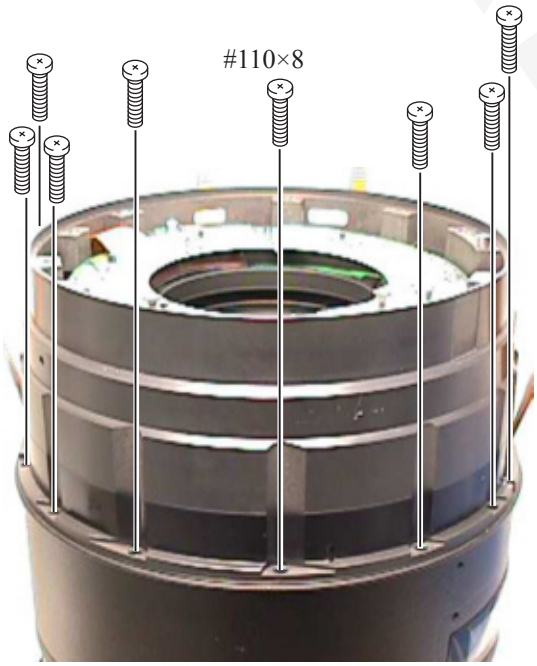


VR unit-assy

- Peel off the four pieces of the kapton tape (#343).
- Disconnect the FPC from the connector of the main PCB unit.

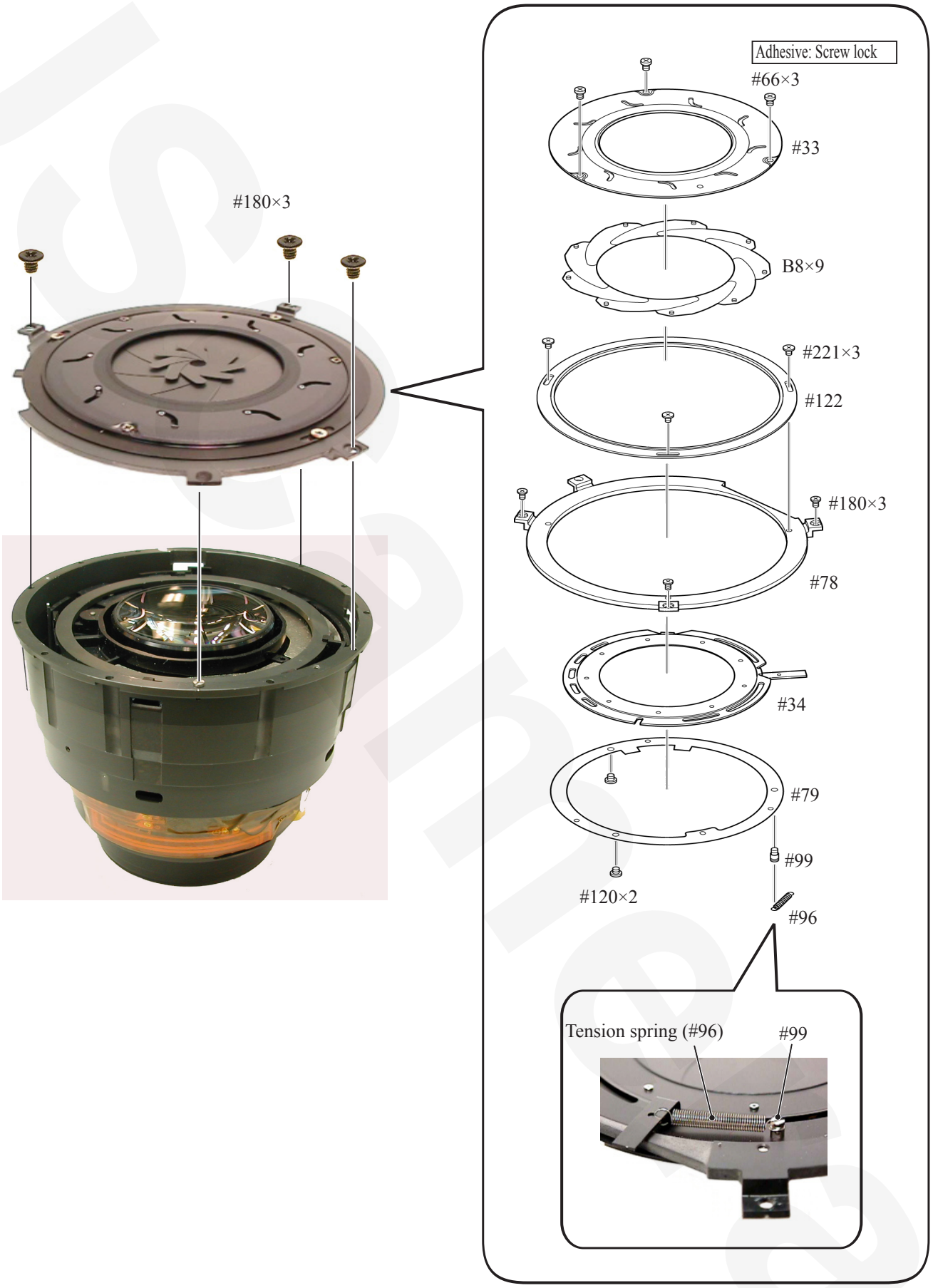


- Take out the eight screws (#110) and four screws (#106). Being careful of each FPC, remove the VR unit.



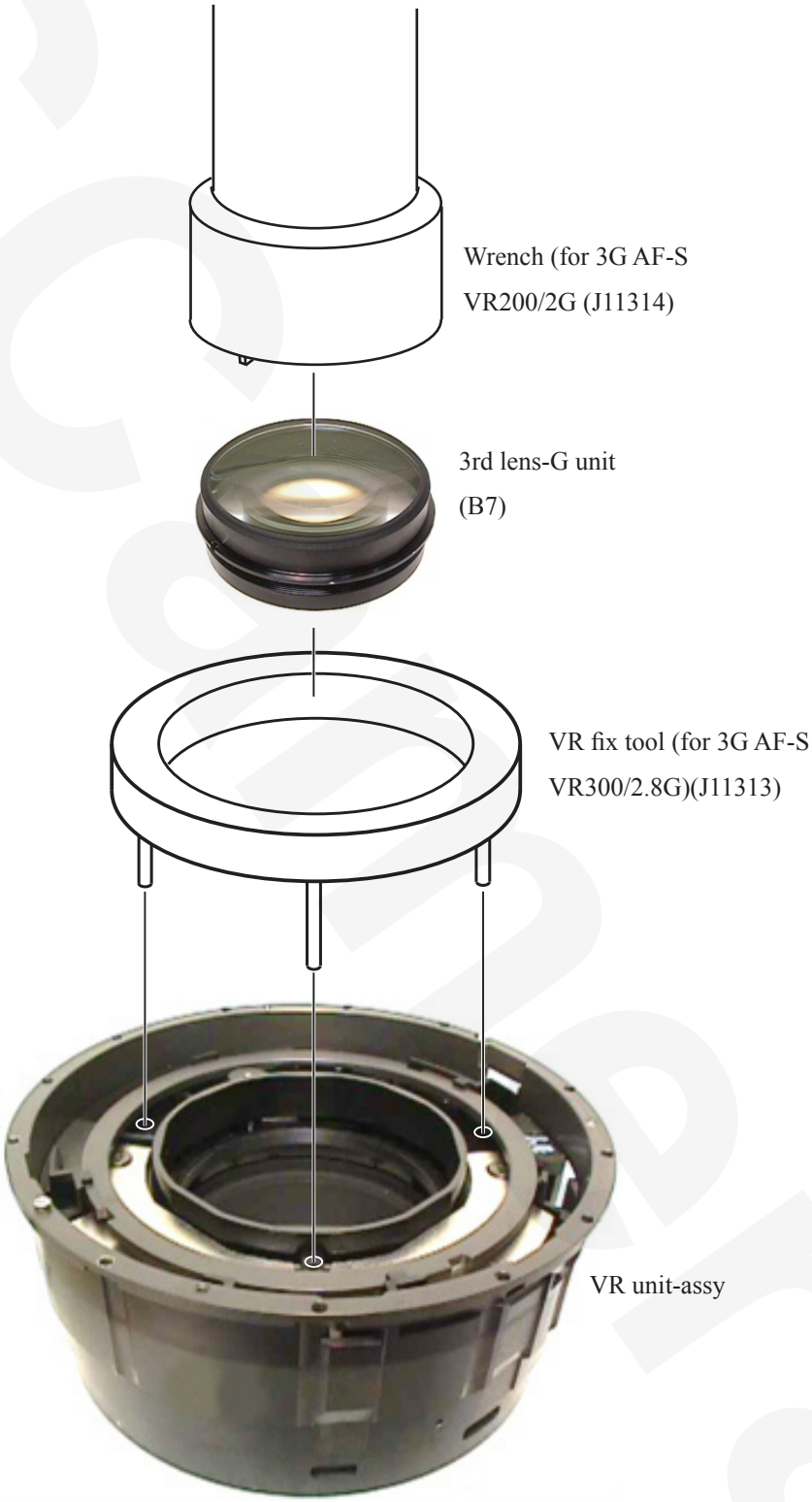
Aperture blade

・Take out the three screws (#180) and remove the aperture blade section.



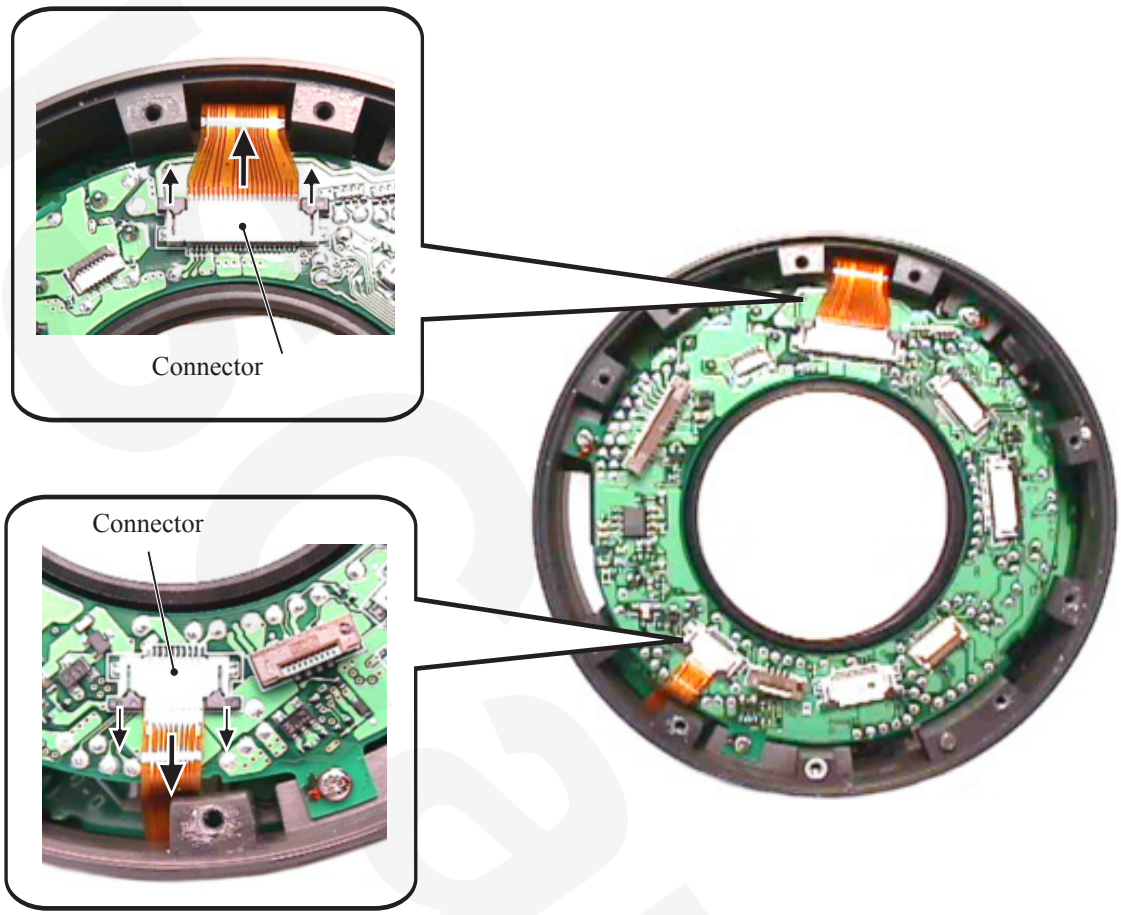
3rd lens-G unit

- Mount the VR fix tool (for 3G AF-S VR300/2.8G)(J11313) on the VR unit-assy.
- Remove the 3rd lens-G unit (B7) with the wrench (for 3G AF-S VR200/2G)(J11314).
- Remove above tool (J11313) from the VR unit-assy.



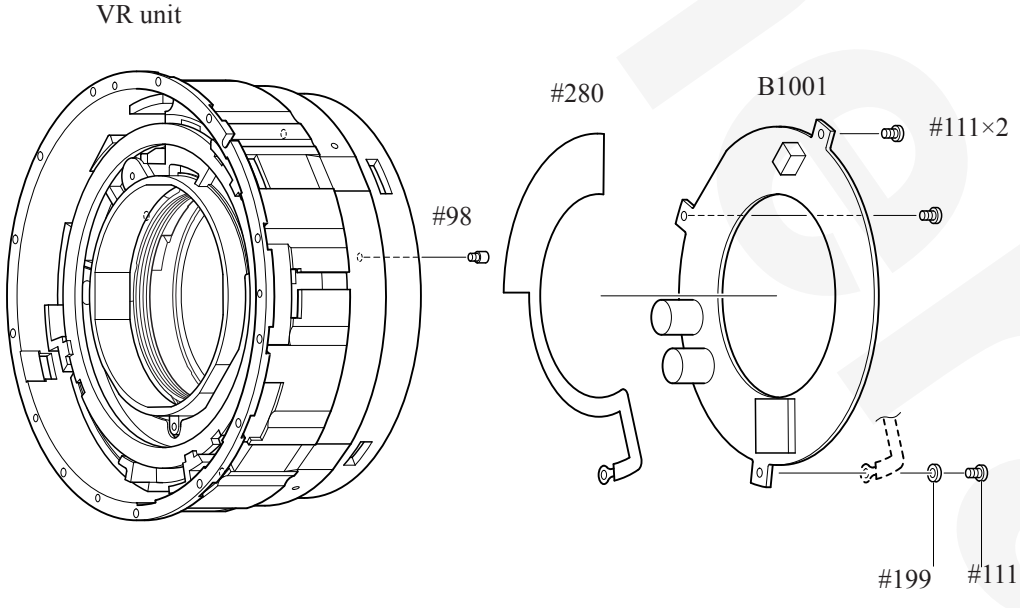
Main PCB unit

・Disconnect the FPC from the connector of the VR unit-assy.



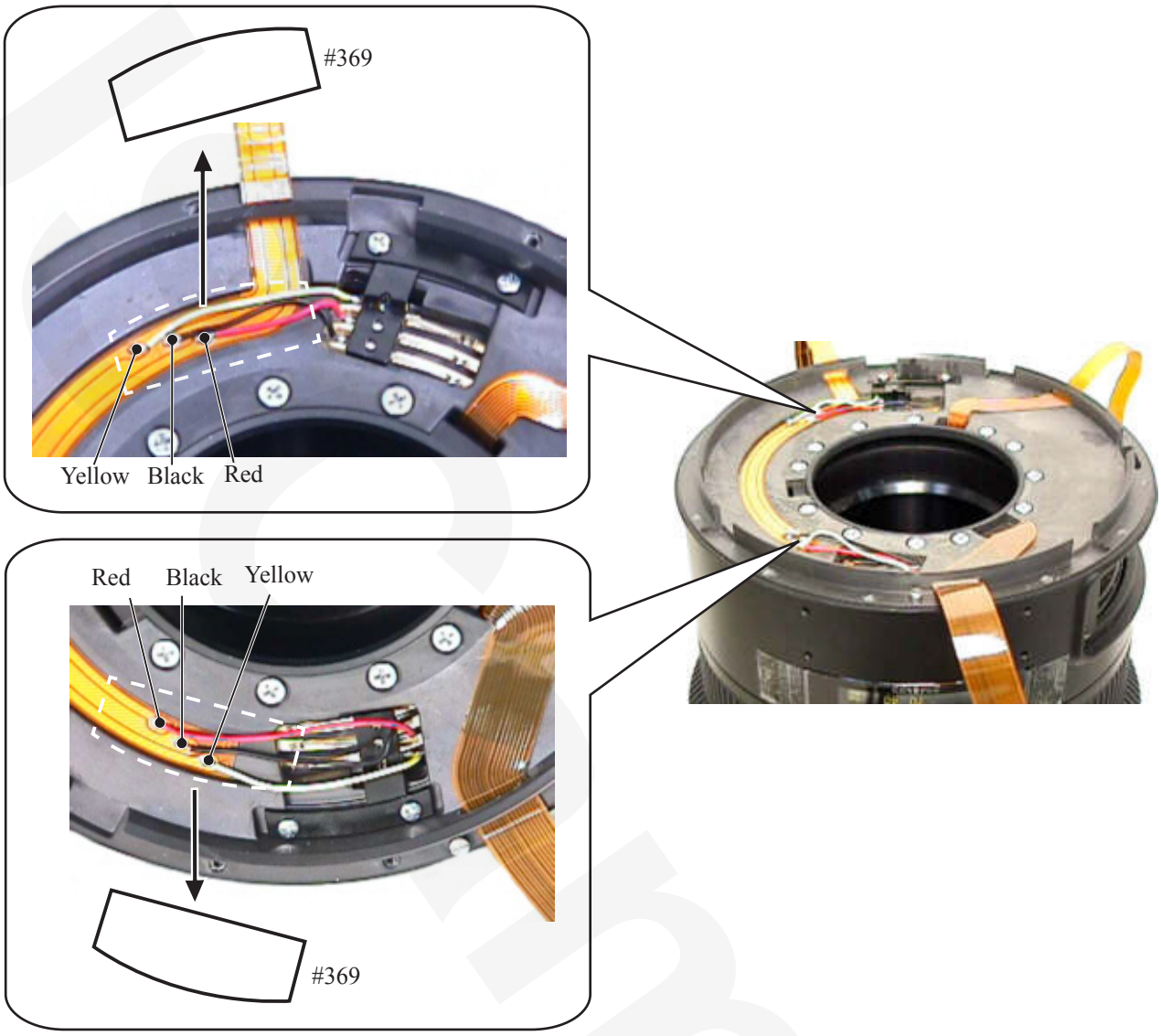
VR unit-assy

・Take out the three screws (#111) and the washer (#199). Remove the main PCB unit (B1001) and shield (#280) from the VR unit-assy.

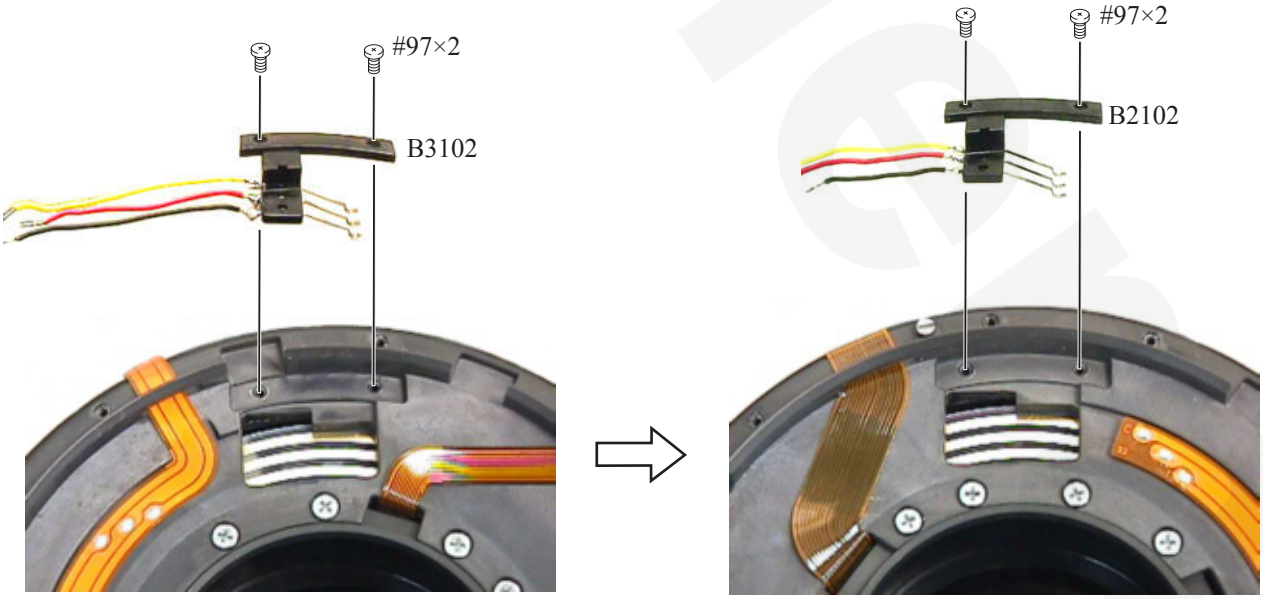


Power brush unit 1, 2

・Unsolder each wire.

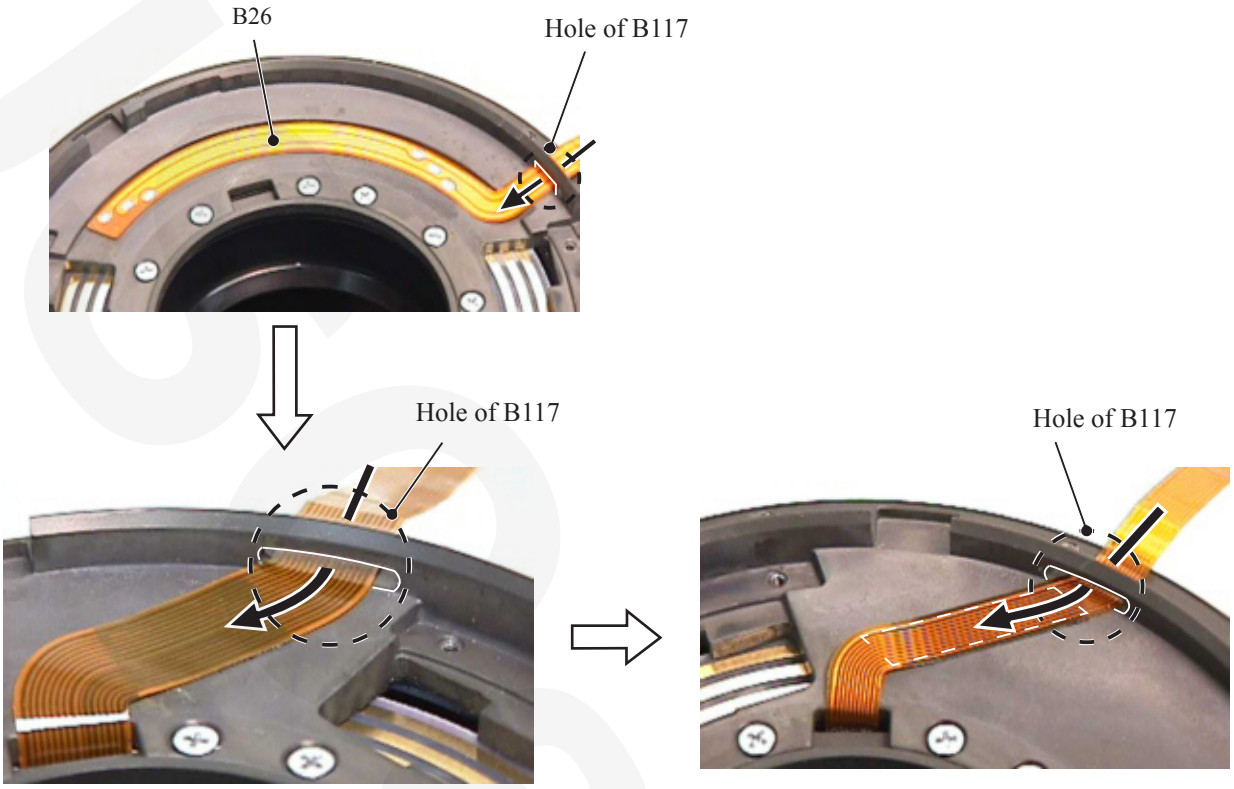


・Remove the power brush unit 1 (B2102) and 2 (B3102).



SWM power FPC unit

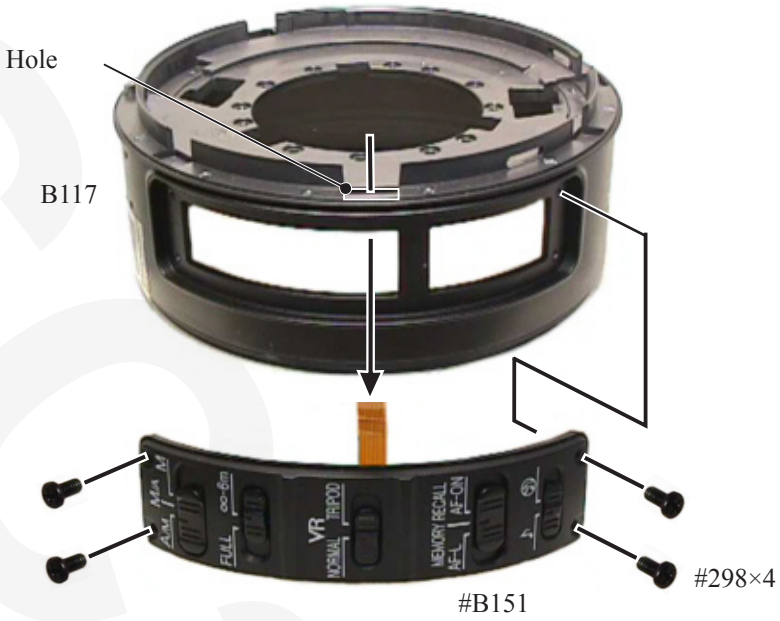
・Remove the SWM power FPC unit (B26) by passing its FPC through the hole of the SWM fixed tube unit (B117).



SWM fixed tube unit

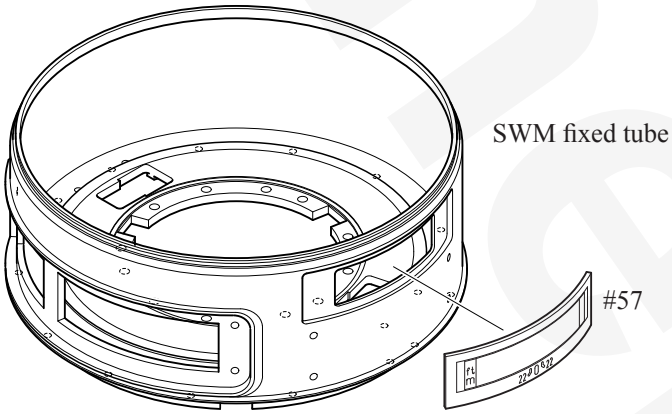
Change SW unit

・Take out the four screws (#298). While pulling out the FPC area, remove the change SW unit (B151).



Focus window

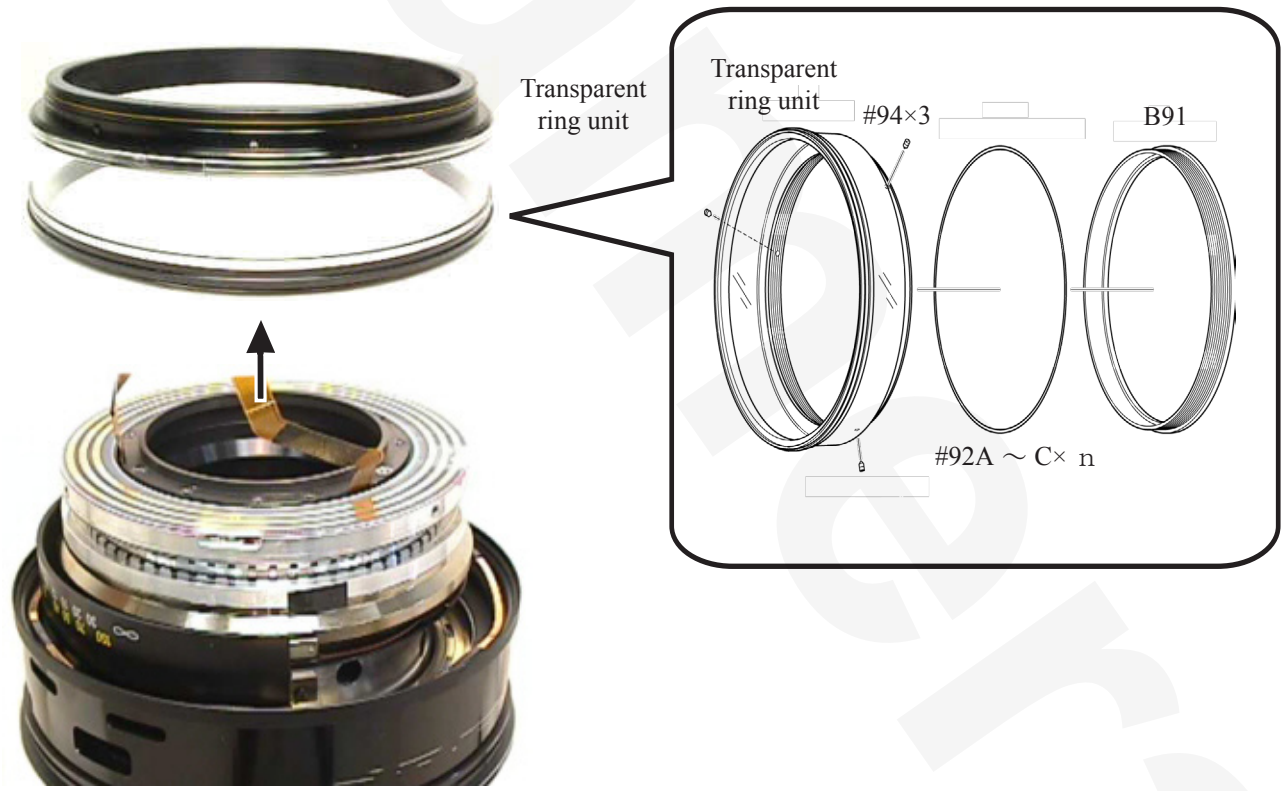
・Remove the focus window (#57) from the SWM fixed tube.



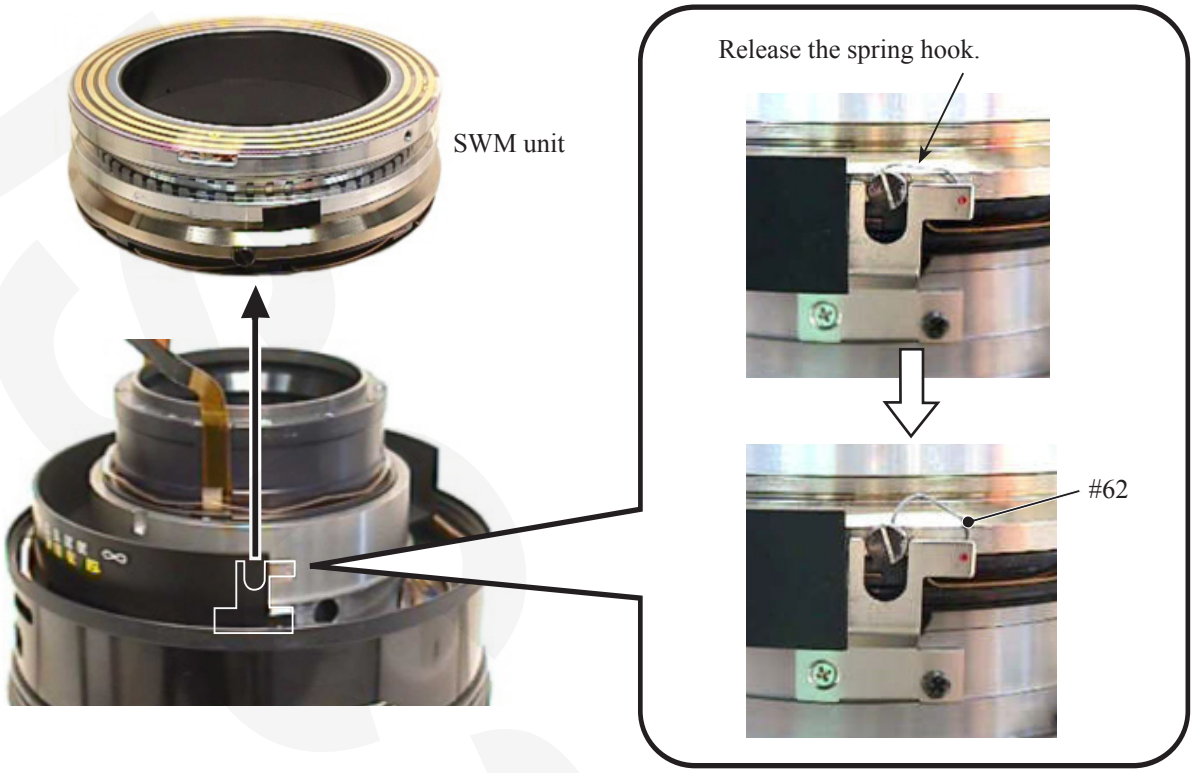
Guide roller

・Remove the three guide rollers (#108) from the SWM unit.

Transparent ring unit



SWM unit



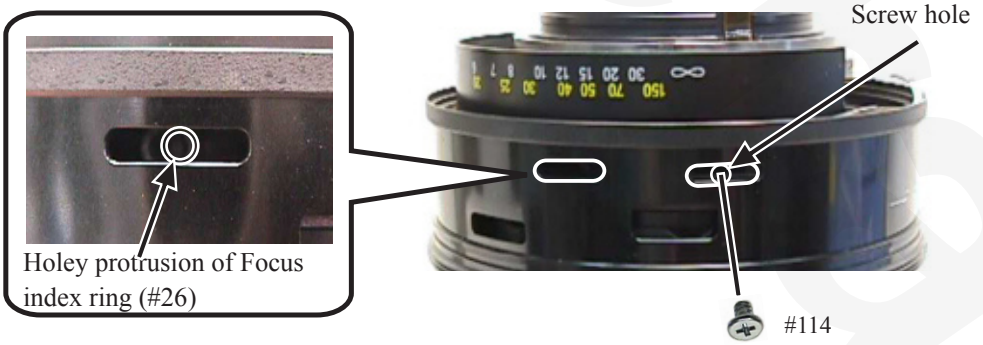
FPC retainer washer, Wave washer

・Remove the wave washer (#192) and FPC retainer washer (#203) from the fixed tube unit.

MF ring unit, Rubber ring, Wave washer unit, Focus index ring, SWM unit

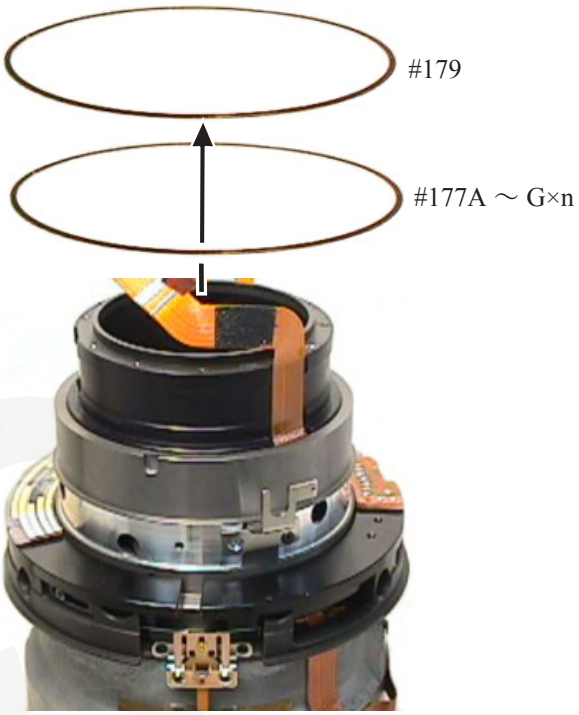
・Remove the focus index ring (#26), wave washer unit (B82), rubber ring (#176), and MF ring unit.

Align the "A section" of the focus index ring (#26) with the screw hole of the SWM unit, then take out the screw (#114).



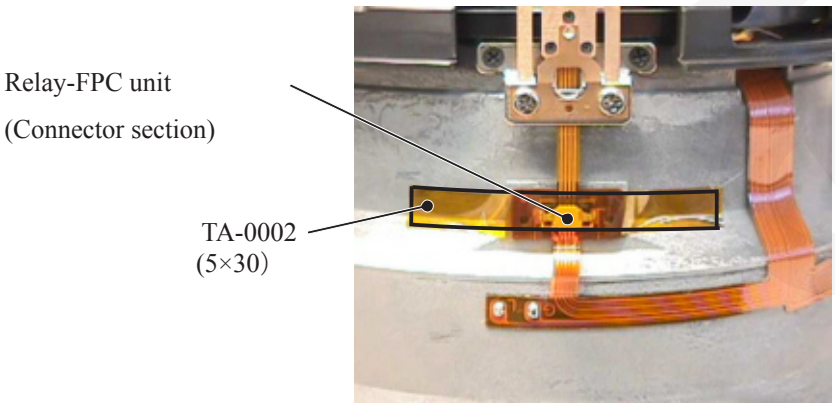
Washer

・Remove the washers (#179 and #177).

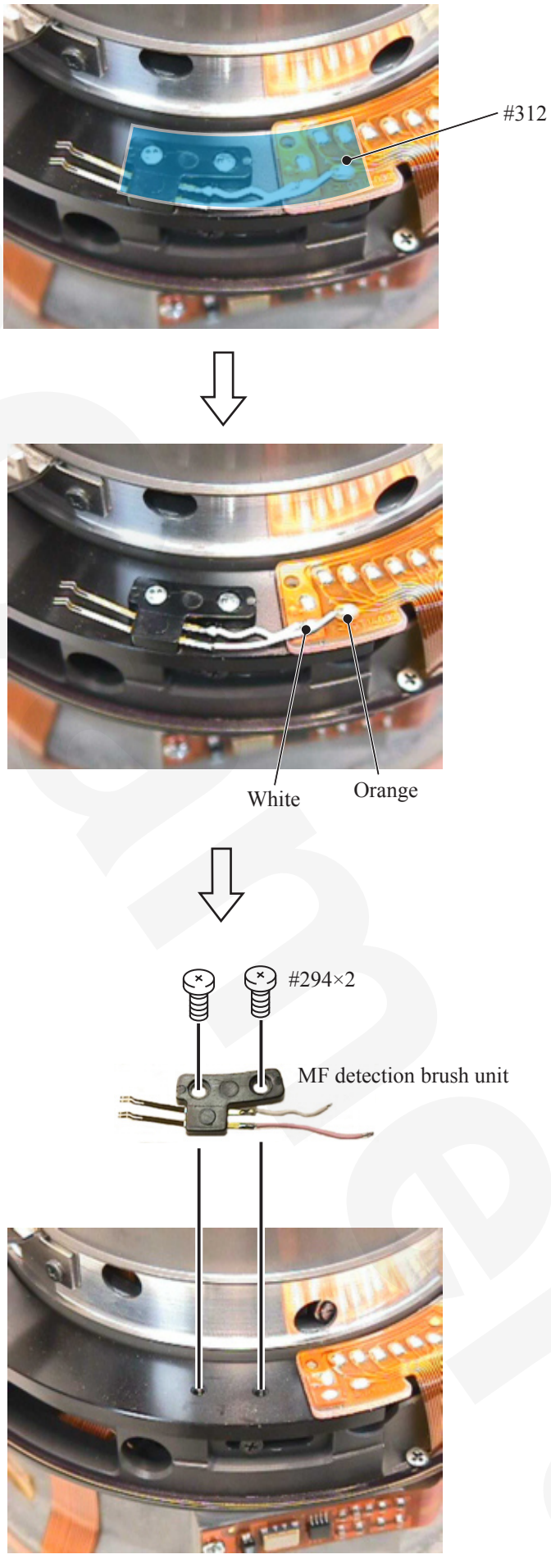


Peel off Tape

・Peel off the tape [TA-0002 (5×30)] from the relay-FPC unit (connector section).

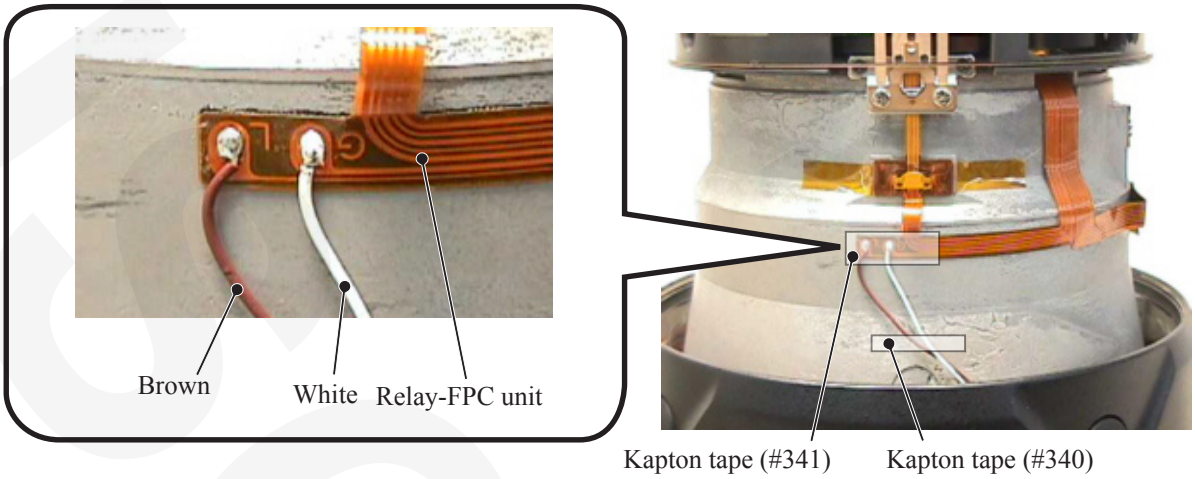


MF detection brush unit



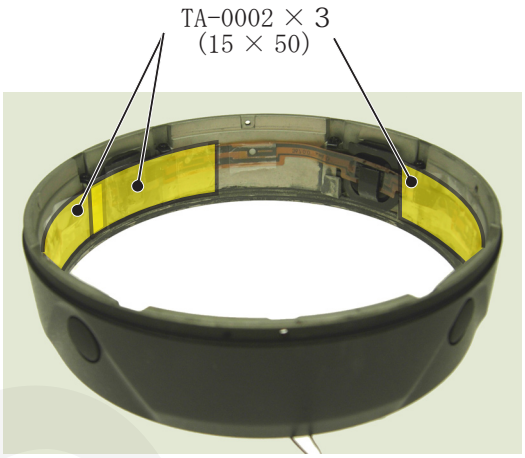
AF lock ring

・Remove the lead wire (FL-FPC) from relay-FPC unit .

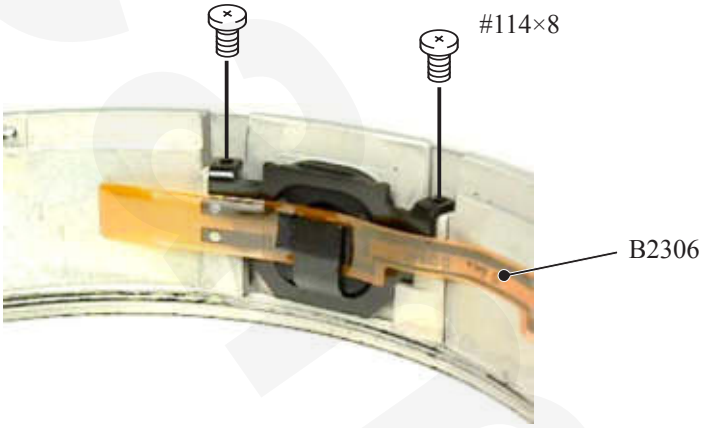


・Remove the AF lock ring (#52) from the front fixed tube (#35) by taking out the four screws (#67).

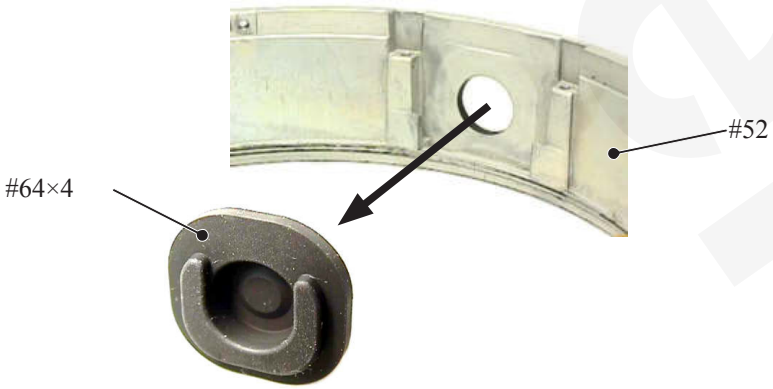
・Peel off the three pieces of the polyester film (TA-0002).



・Remove the AF lock FPC unit (B2306) from the AF lock ring (#52) by taking out the eight screws (#114).

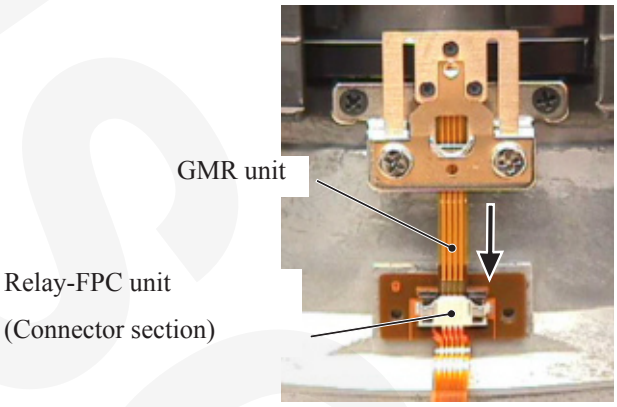


・Remove the four pieces of the AF lock rubber (#64) from the AF lock ring (#52).

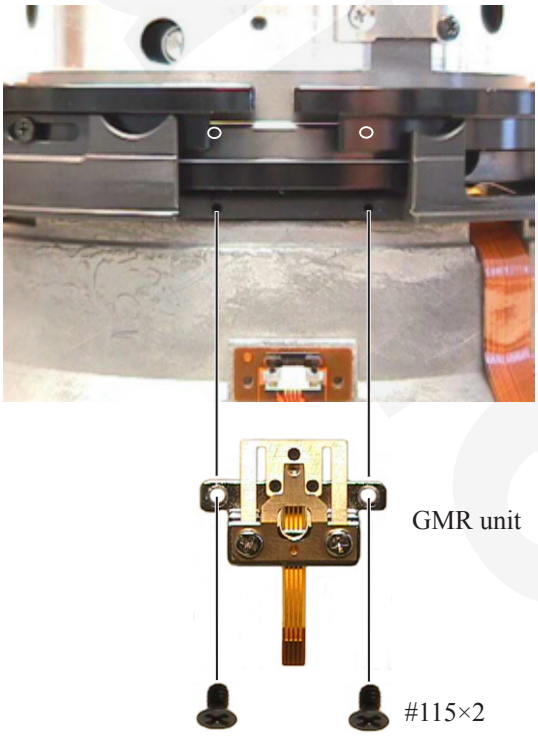


GMR unit

・Disconnect the FPC of the GMR unit from the relay-FPC unit (connector section).

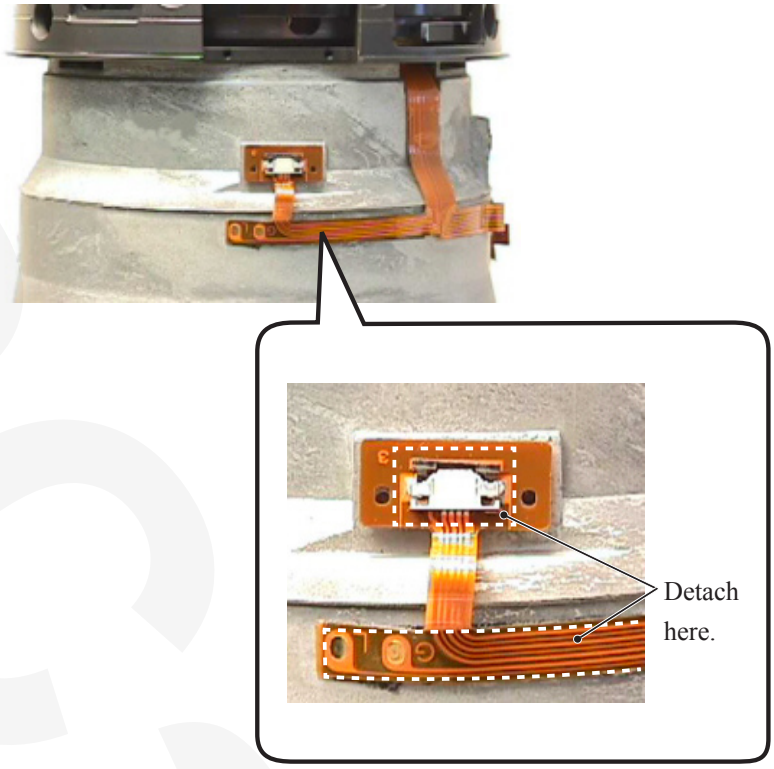


・Take out the two screws (#115) and remove the GMR unit from the fixed tube unit.



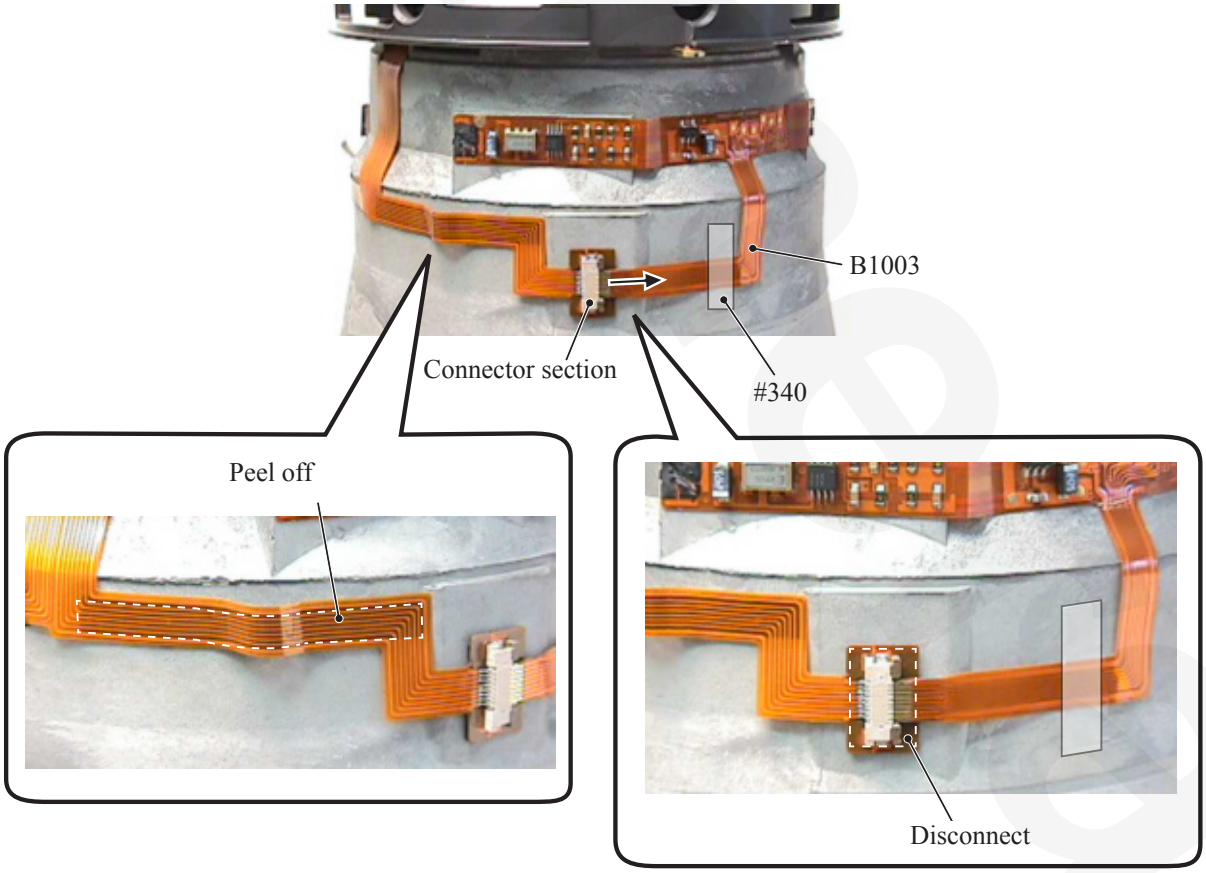
Gyro FPC unit

・Detach the relay-FPC unit (connector section) as below.



・Peel off the FPC part of the gyro-FPC unit (B1003) from the fixed tube unit.

・Disconnect the gyro-FPC unit (B1003) from the connector of the fixed tube unit by pulling in the direction of the arrow.



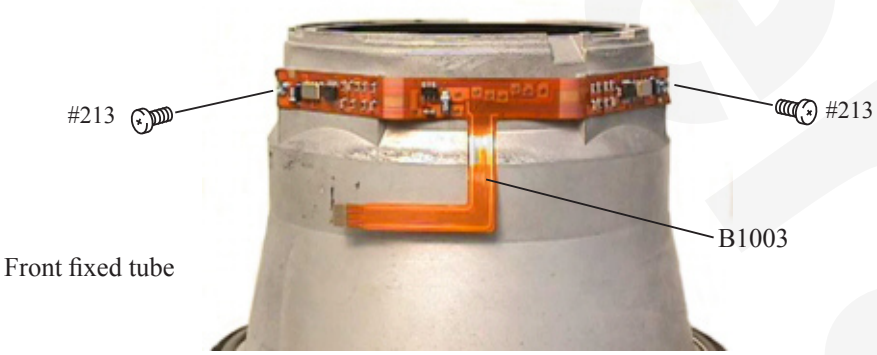
Gyro-PCB unit

△ (Addition)

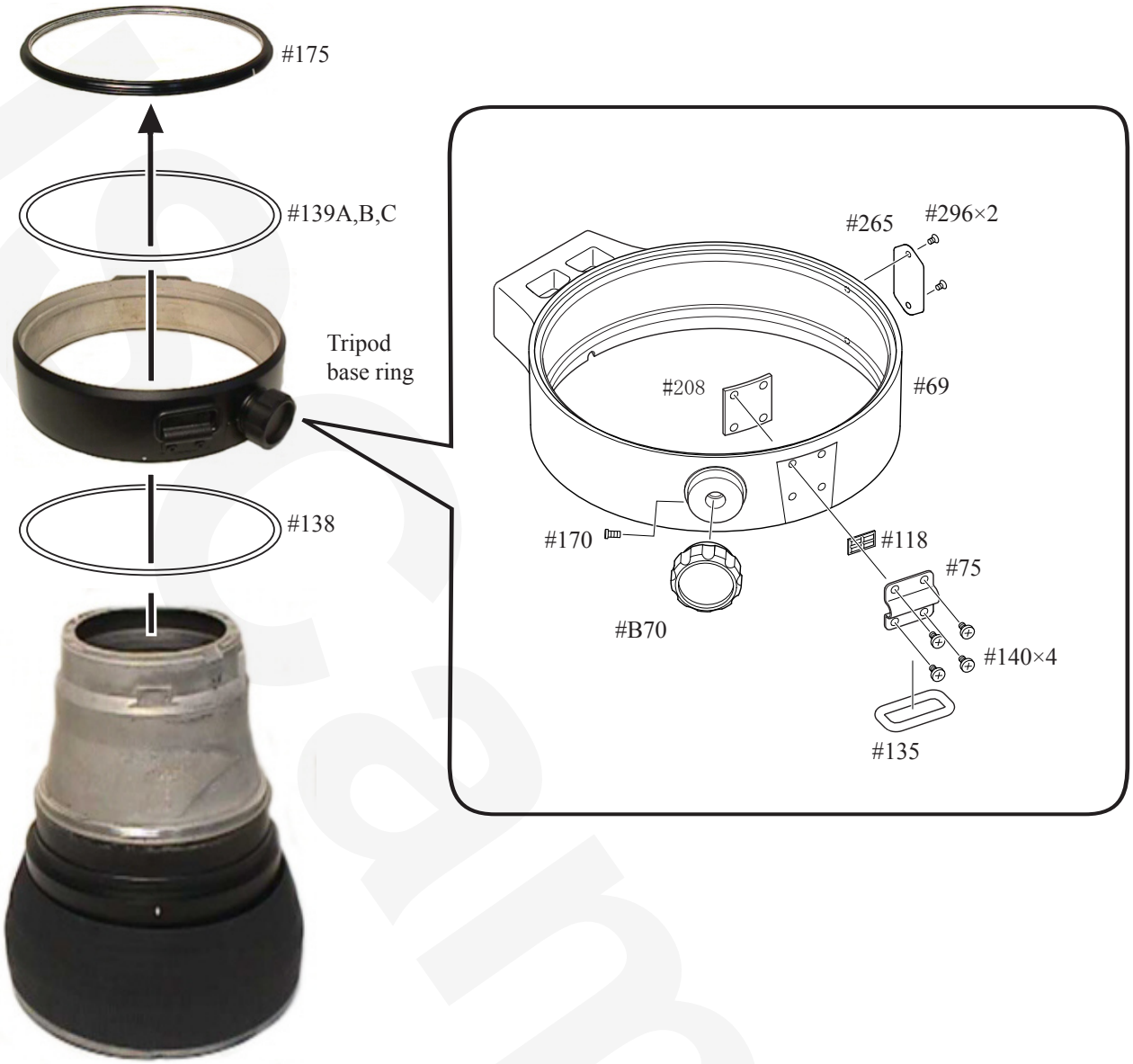
・Take out the screws (#109) with a driver (T91313).

・Remove the front fixed tube from the fixed tube unit.

・Take out the two screws (#213), and remove the gyro-PCB unit (B1003) from the front fixed tube.

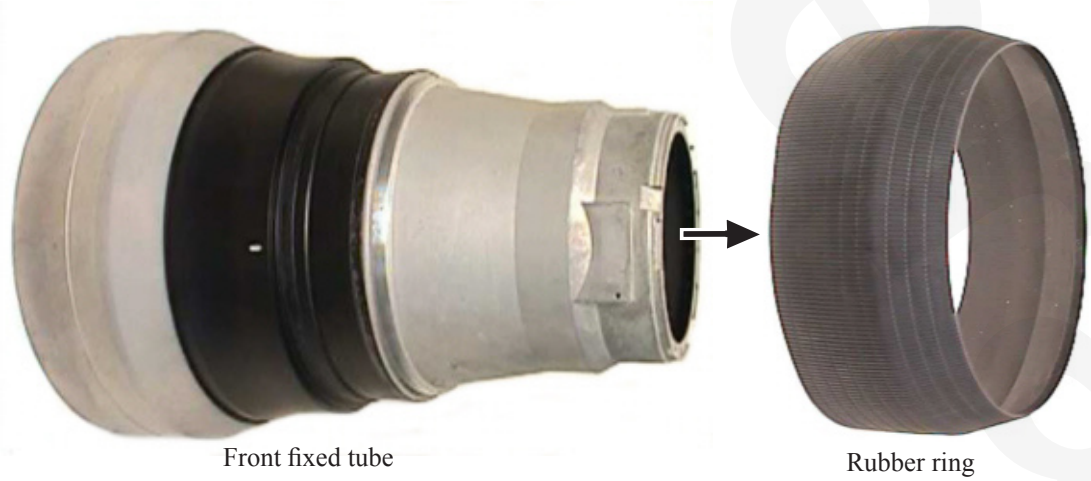


Tripod base ring



Front fixed tube

・Remove the rubber ring from the front fixed tube.



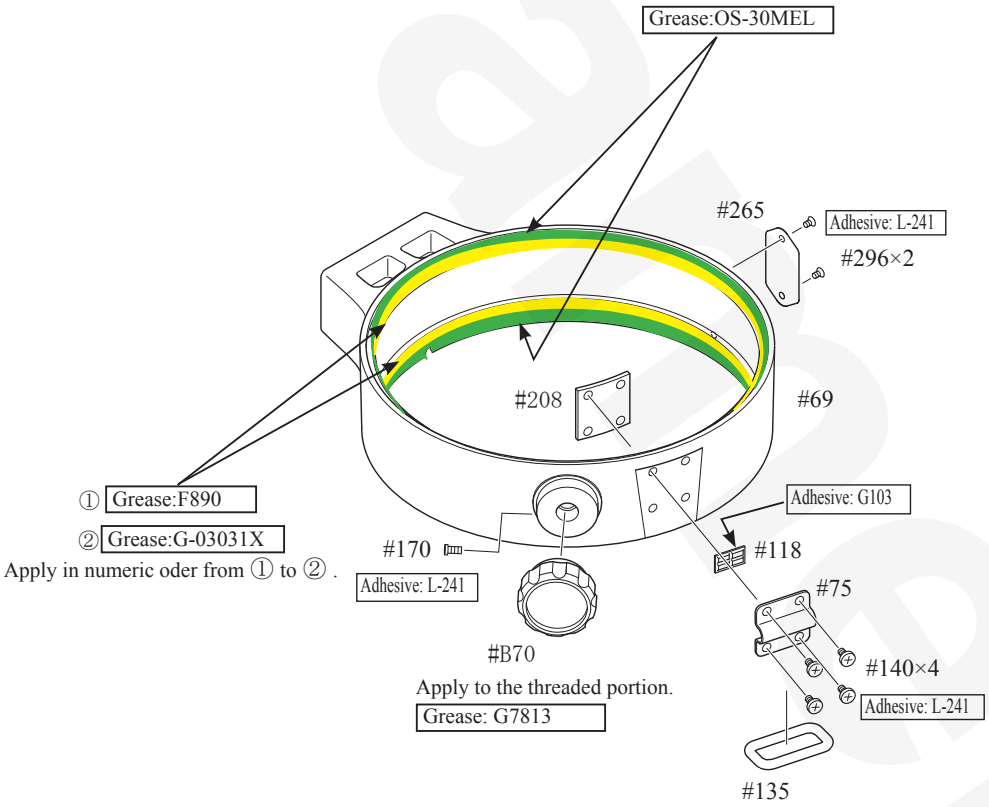
2. Assembly / Adjustment

Front fixed tube

・Mount the rubber ring on the front fixed tube.

Front fixed tube　　Rubber ring

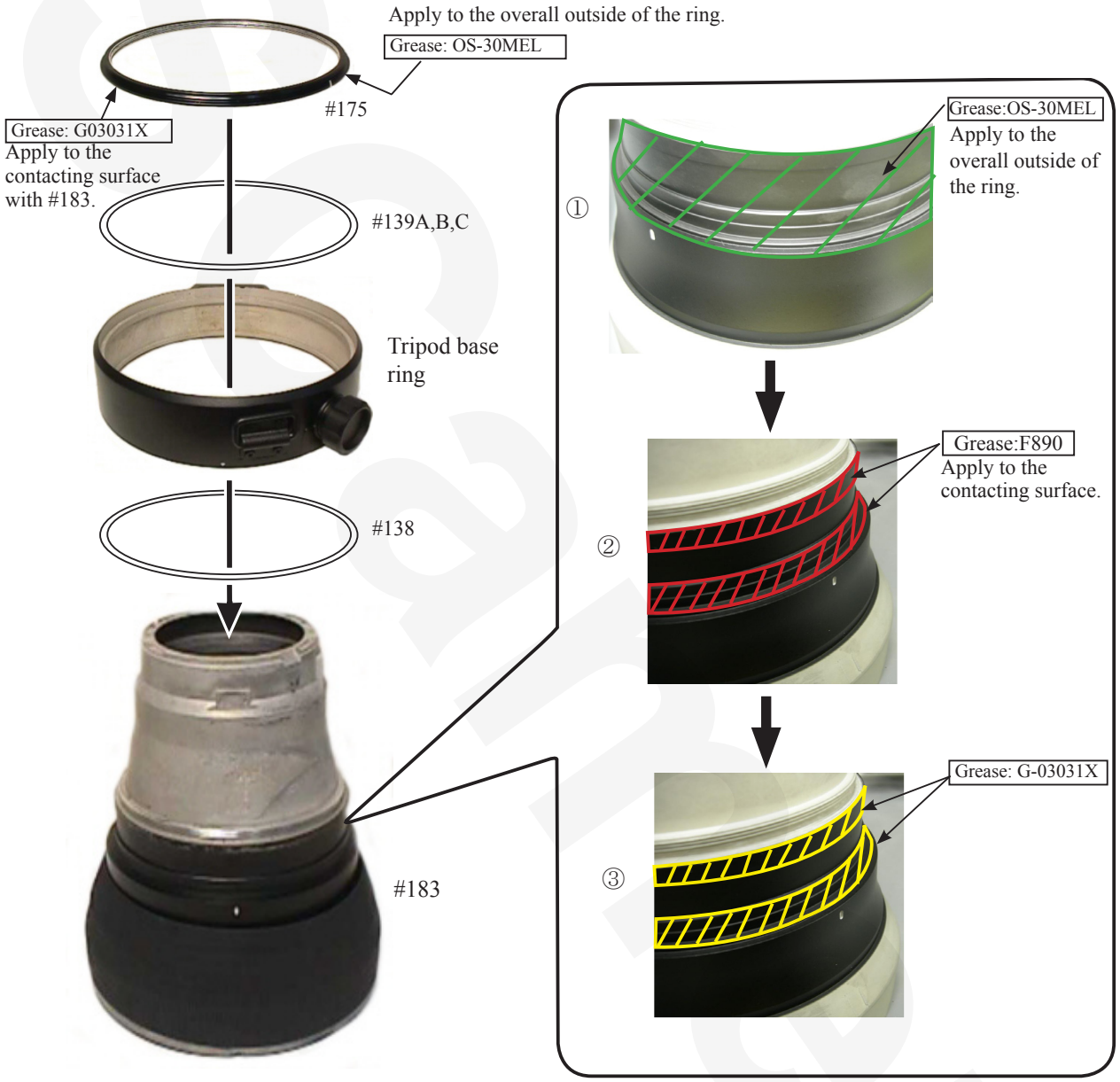
Tripod base ring



サービス計画課 M

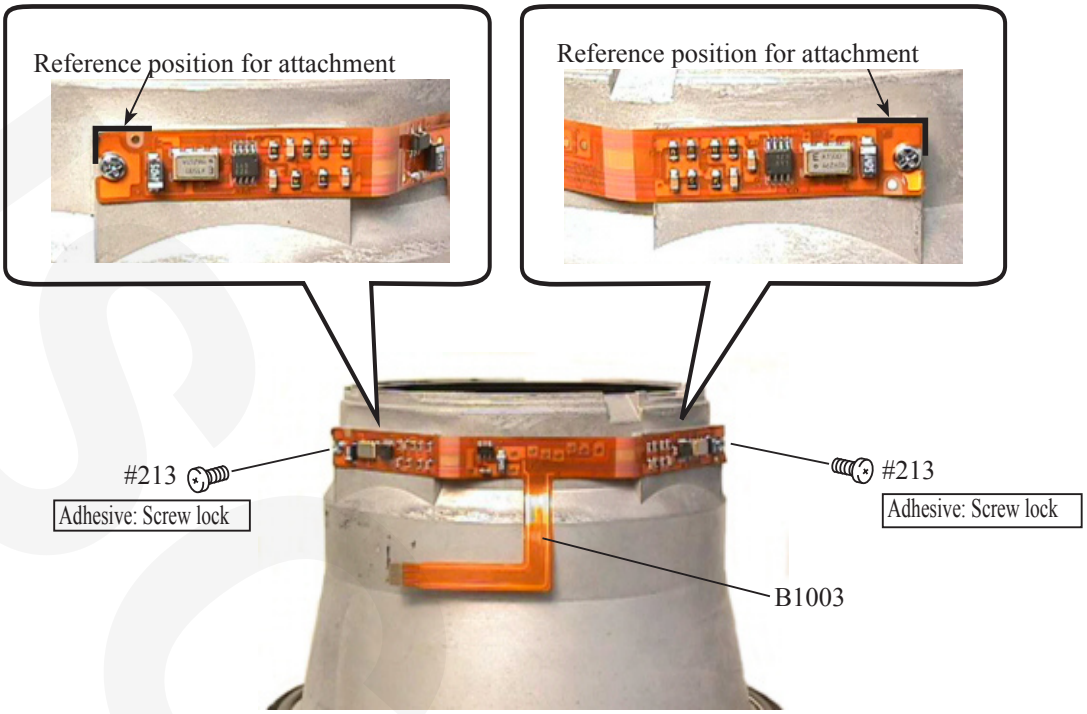
Mount the tripod base ring

- Apply OS-30MEL, F-890, and G-03031X in numeric order from ① to ④ .
- Adjust the play of the tripod base ring by the adjustment washer (#139 selected from A,B,or C).



サービス計画課 M

Gyro-PCB unit



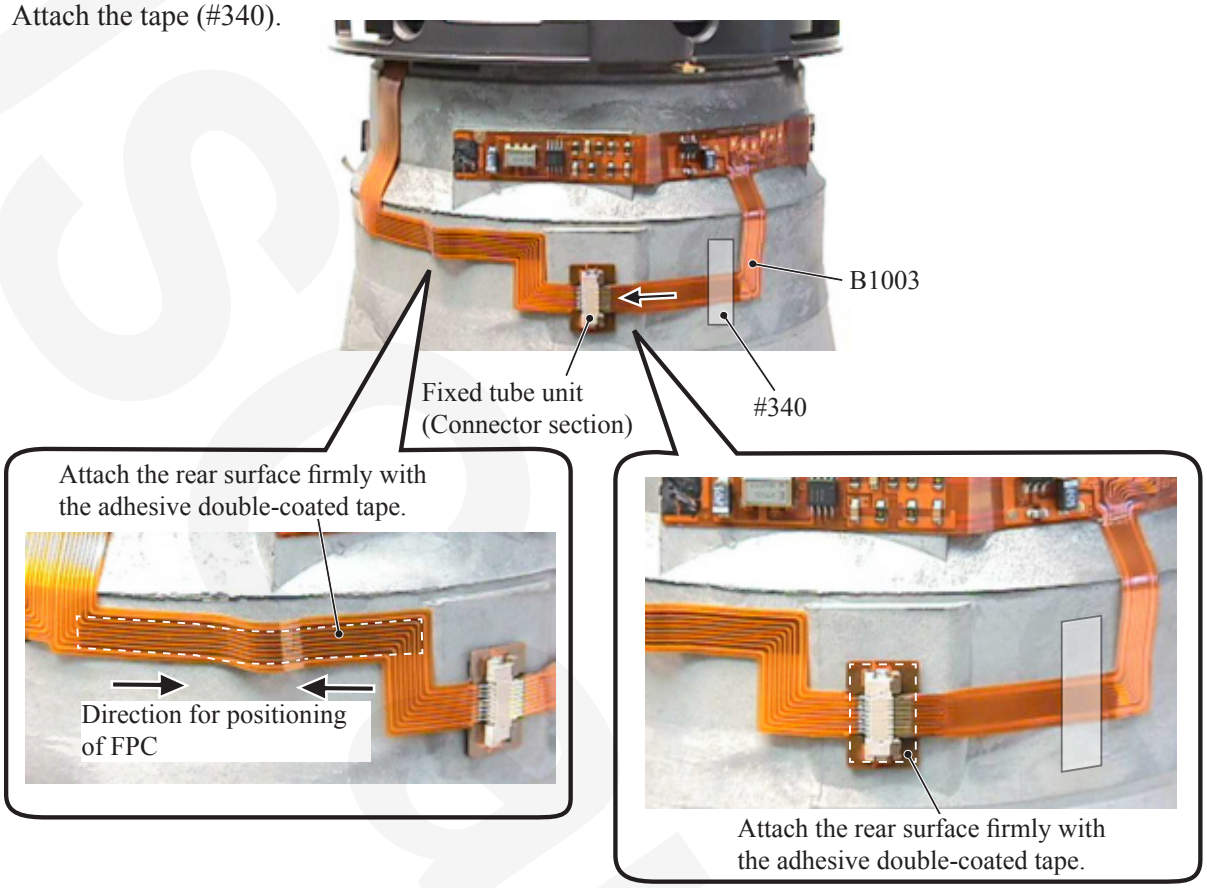
・Mount the front fixed tube on the fixed tube unit.

・Tighten the screws (#109) with a driver (T91313).

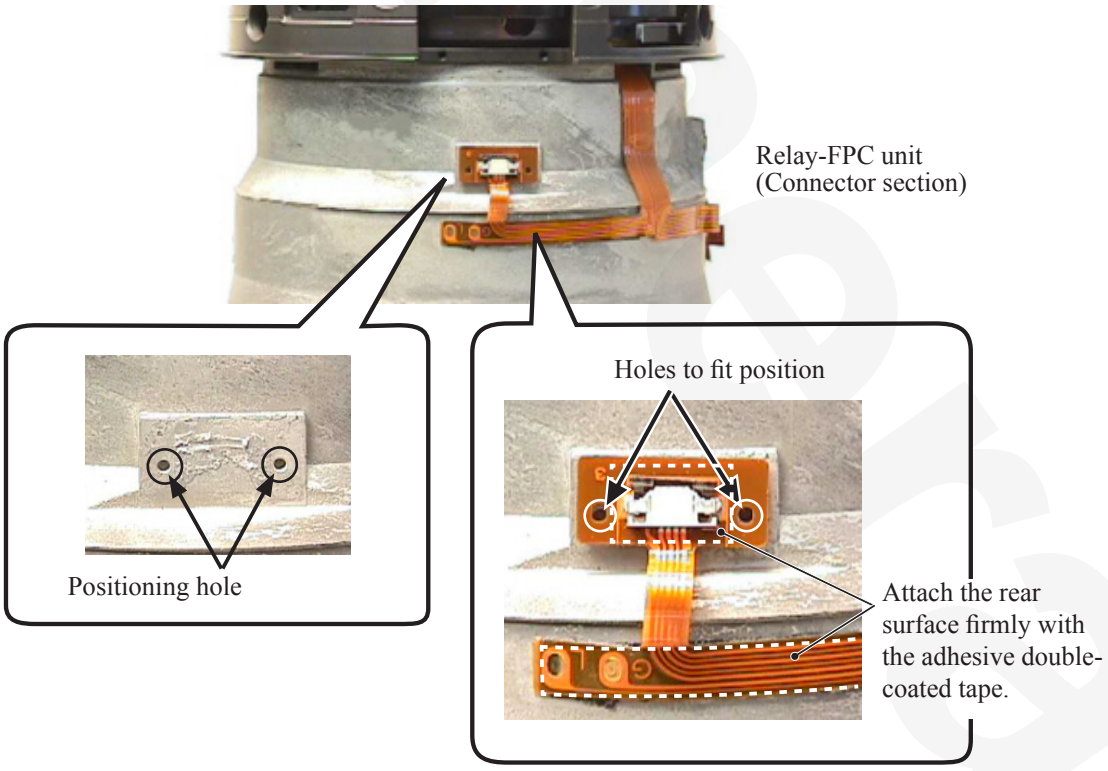
△ (Addition)

Gyro FPC unit

- Connect the FPC of the gyro relay-FPC unit (B1003) to the connector section of the fixed tube unit.
- Attach the connector section of the fixed tube unit firmly with the tape as below.
- Attach the FPC of the fixed tube unit firmly with the adhesive double-coated tape.
- Attach the tape (#340).

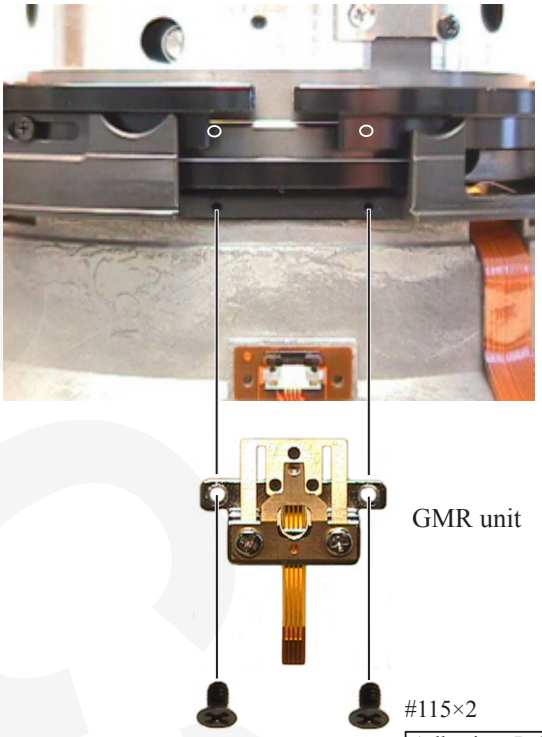


- Align the positioning holes of the fixed tube unit with the holes of the relay-FPC unit (connector section), then attach the relay-FPC unit.

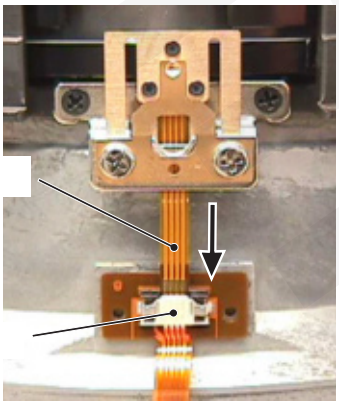


Mounting of GMR unit

・Mount the GMR unit on the fixed tube unit, and tighten the screws (#115).

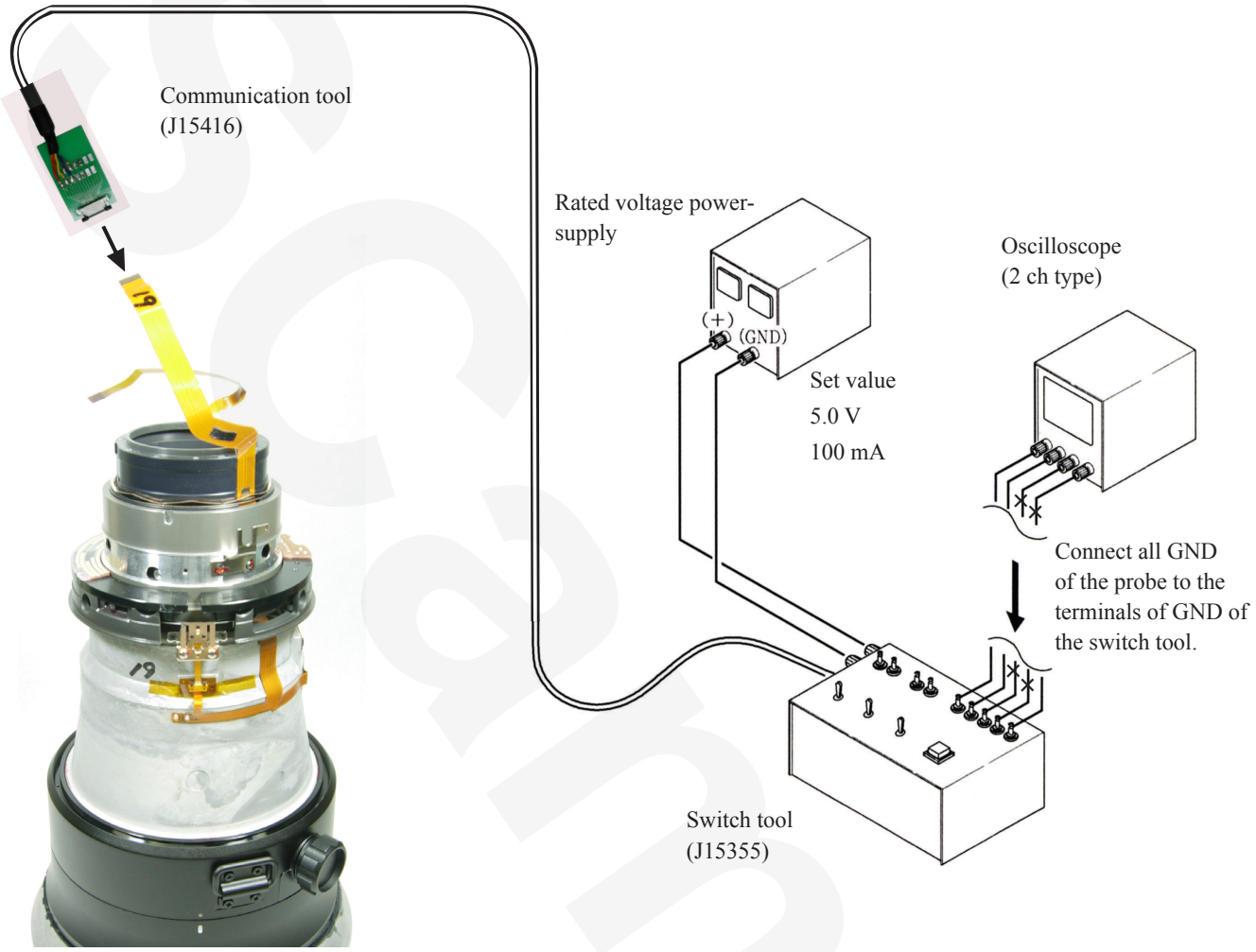


・Connect the FPC of the GMR unit into the relay-FPC unit (connector section).



Output waveform inspection of GMR encoder

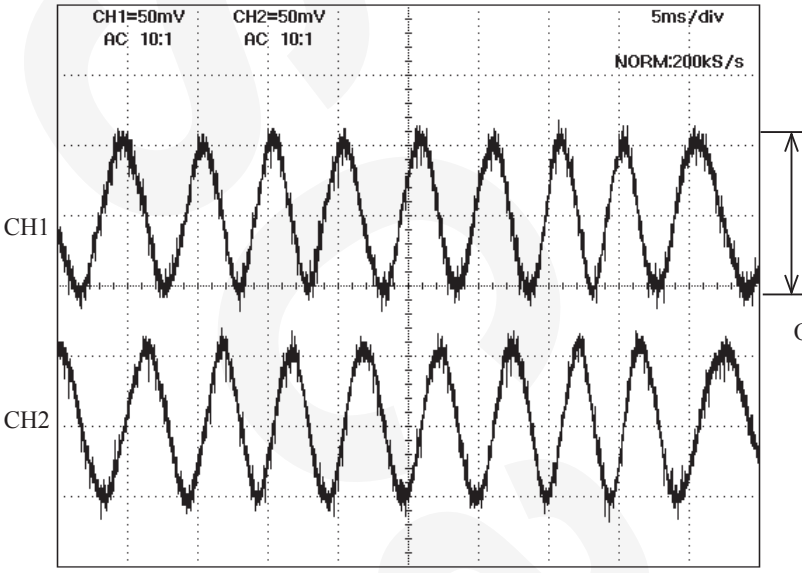
【Connection diagram】



Output waveform inspection of GMR encoder

① Turn the switch 1 to OFF, switch 2 to OFF and switch 3 to ON of the Switch tool.
② Confirm that the electric current and voltage of the connected rated voltage power-supply are set values, then turn it ON.
③ Set the oscilloscope and turn "A area" manually.
④ Check the waveform of the oscilloscope by stopping with "START/STOP" key.

Note: The waveform varies according to the rotational speed of the focus ring. So change "Time/Div setting accordingly.



Oscilloscope setting

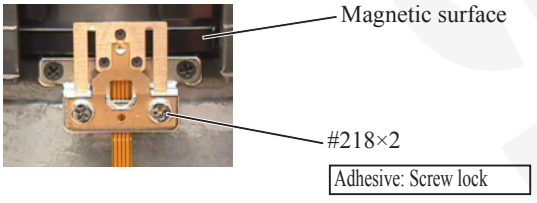
V/Div (ch1)	: 50 mV
V/Div (ch2)	: 50 mV
Coupling	: AC
Time/Div	: 5 m Sec
Trigger Mode	: NORMAL
Trigger Coupling	: AC

Standard: Amplitude of all pulses/waveforms is 80mV or more.

Note: Check the waveform by moving "A area" back and forth from the infinity-end to the close-end positions entirely.

⑤ In case large waveform-noise is detected, use the FILTER function.
How to set FILTER function (e.g. DL1540 manufactured by YOKOGAWA)
1. Press the FILTER button.
2. Select **"Smooth" of the menu on screen and turn it ON.**

⑥ In case the amplitude is small, make an adjustment by two screws (#218).

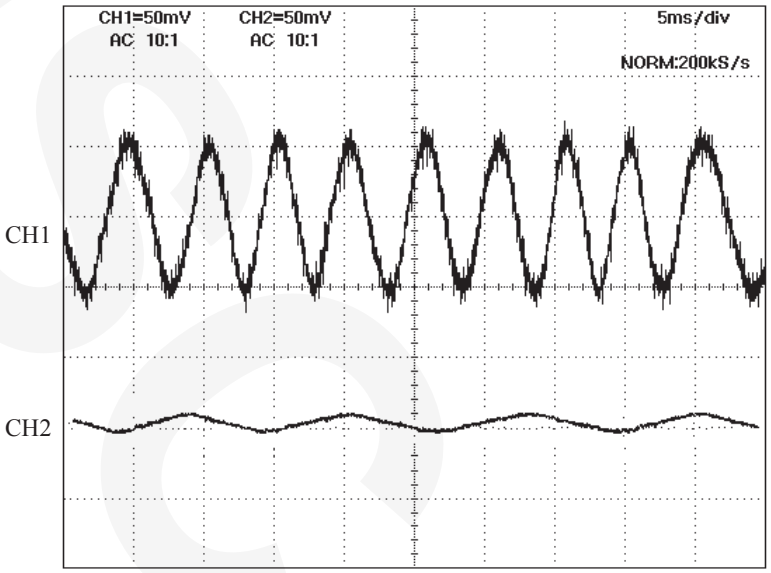


⑦ Turn off the rated voltage power-supply.

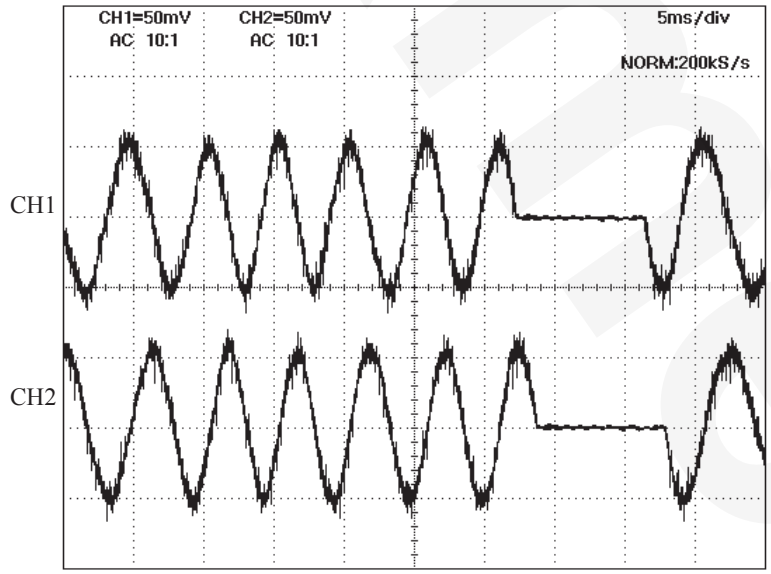
Note: When adjustments are made, prevent the magnetic tape and MR head from touching the magnetized driver bit. Otherwise, the magnetic data will be damaged.

＜ Reference ＞

● If the only amplitude of either CH1 or CH2 is small, one of the 2 screws (#218) may be loosened, so check for it. If this is not the case, the GMR head may malfunction, so be sure to replace the GMR unit and make a readjustment.

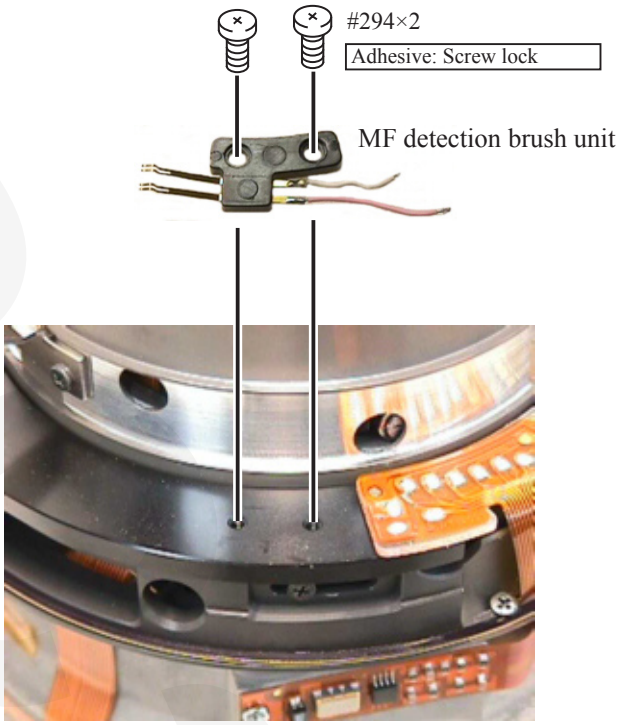


● If the amplitude partially drops between the infinity and the close-distance, the magnetic data of the tape may be damaged.
In this case, replace the fixed-tube unit and make a readjustment. Replacing only the magnetic surface is impossible.

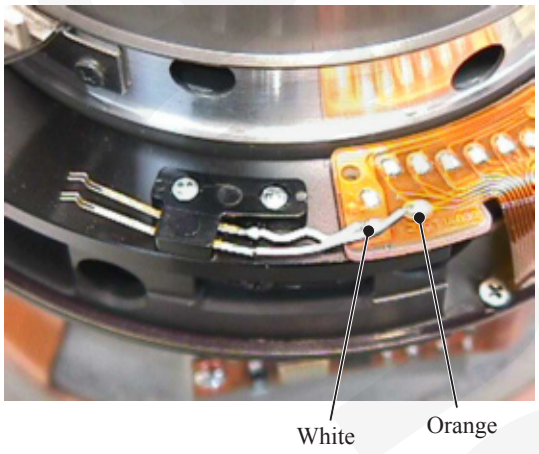


MF detection brush unit

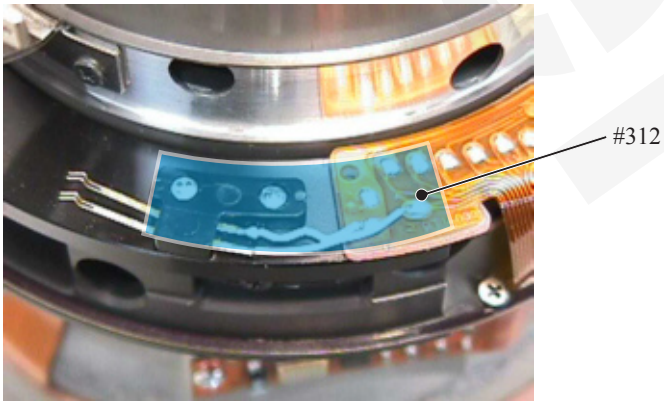
・Mount the MF detection brush unit.



・Solder the wires of the MF detection brush unit.

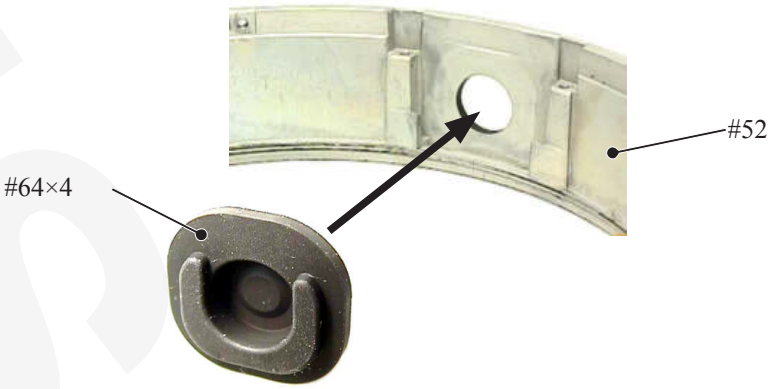


・Attach the polyester tape (#312) to the MF detection brush unit.

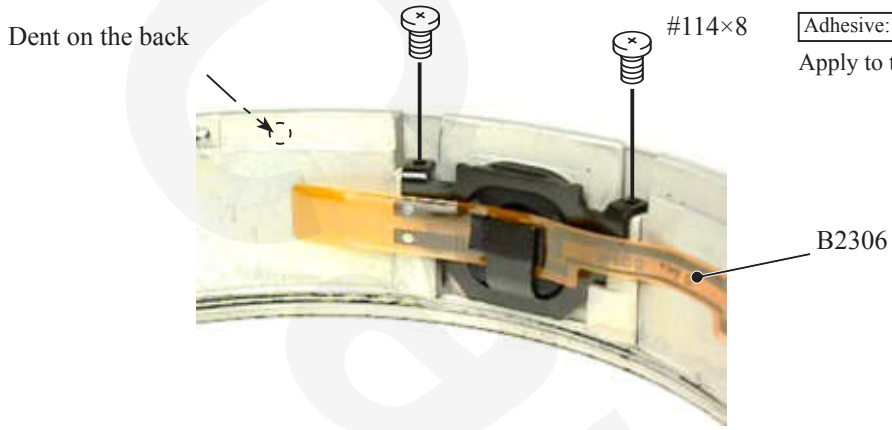


AF lock ring

・Attach the four pieces of the AF lock rubber (#64) to the below each part of the AF lock ring (#52).



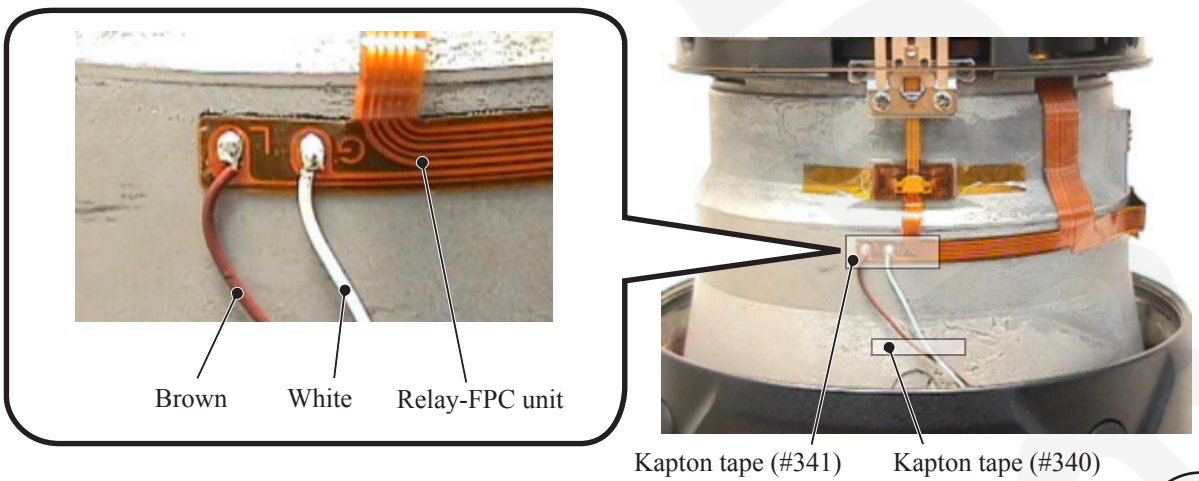
・Attach the AF lock FPC unit (B2306) to the AF lock ring (#52), then tighten two screws (#114) each at four places.



・Fold the extra part of the AF lock FPC unit at three places to fit the size, then attach three pieces of the polyester film (TA-0002）.

・Mount the AF lock ring (#52) on the front fixed tube (#35), and attach four screws (#67) temporarily.

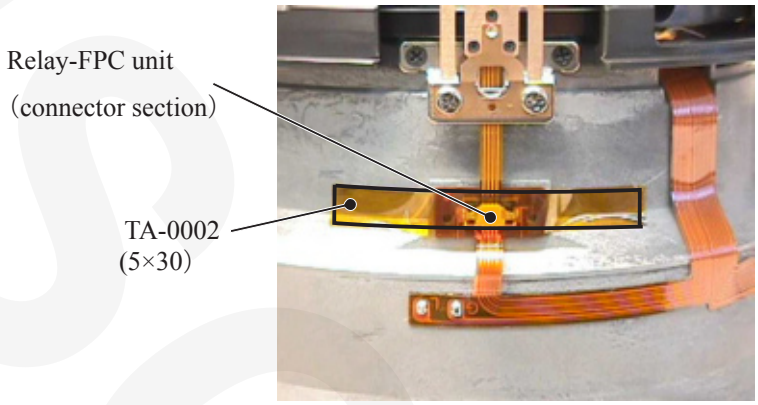
・Solder the lead wire (FL-FPC) on the relay-FPC unit.



サービス計画課 M

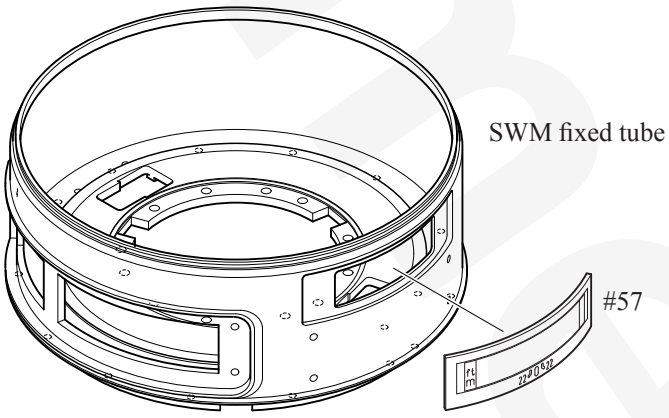
Attachment of Tape

・Attach the tape [TA-0002 (5×30)] to the relay-FPC unit (connector section).



SWM Fixed tube unit

・Attach the focus window (#57) to the SWM fixed tube.



Backlash adjustment of MF ring unit

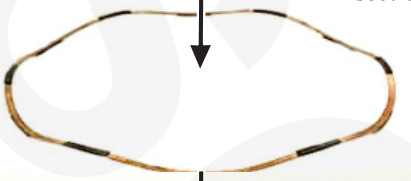
・Mount the SWM fixed tube unit, MF ring unit, and washers (#179 and #177), and check the backlash.

When the MF ring unit is replaced, adjust by the washer (#177 selected from A ～ G×n) so that backlash amount becomes from 0.05 to 0.1 mm.

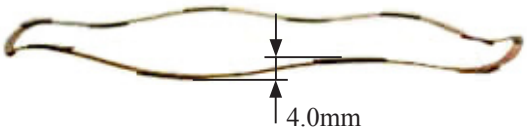
・After the adjustment, remove the SWM fixed tube unit and MF ring unit.

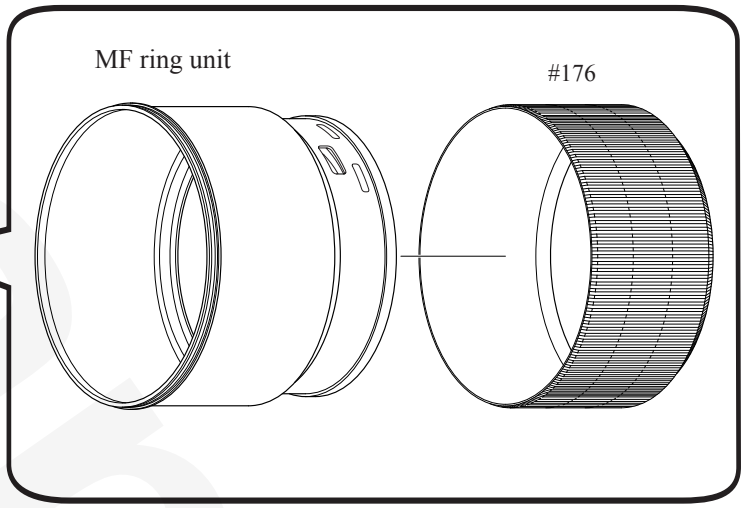
MF ring unit, Rubber ring, Wave washer unit, Focus index ring, SWM unit

・Mount the MF ring unit, rubber ring (#176), wave washer unit (B82), and focus index ring (#26).

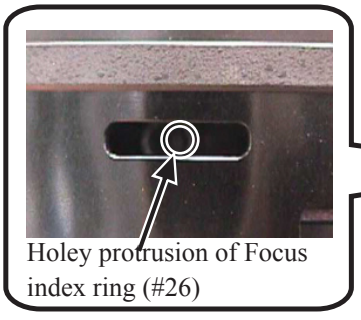


Check the height of the wave washer unit (B82).



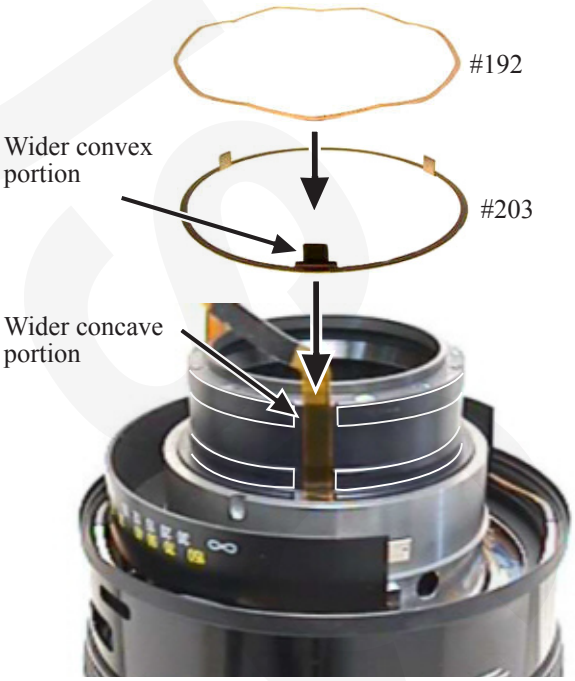


Align the "A section" of the focus index ring (#26) with the screw hole of the SWM unit, then attach the screw (#114) temporarily.

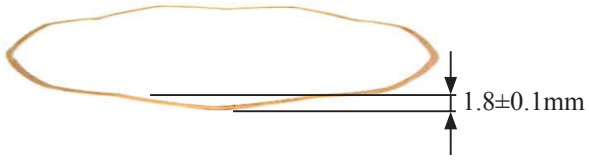


FPC retainer washer, Wave washer

・Mount the FPC retainer washer (#203) and wave washer (#192) on the fixed tube unit.

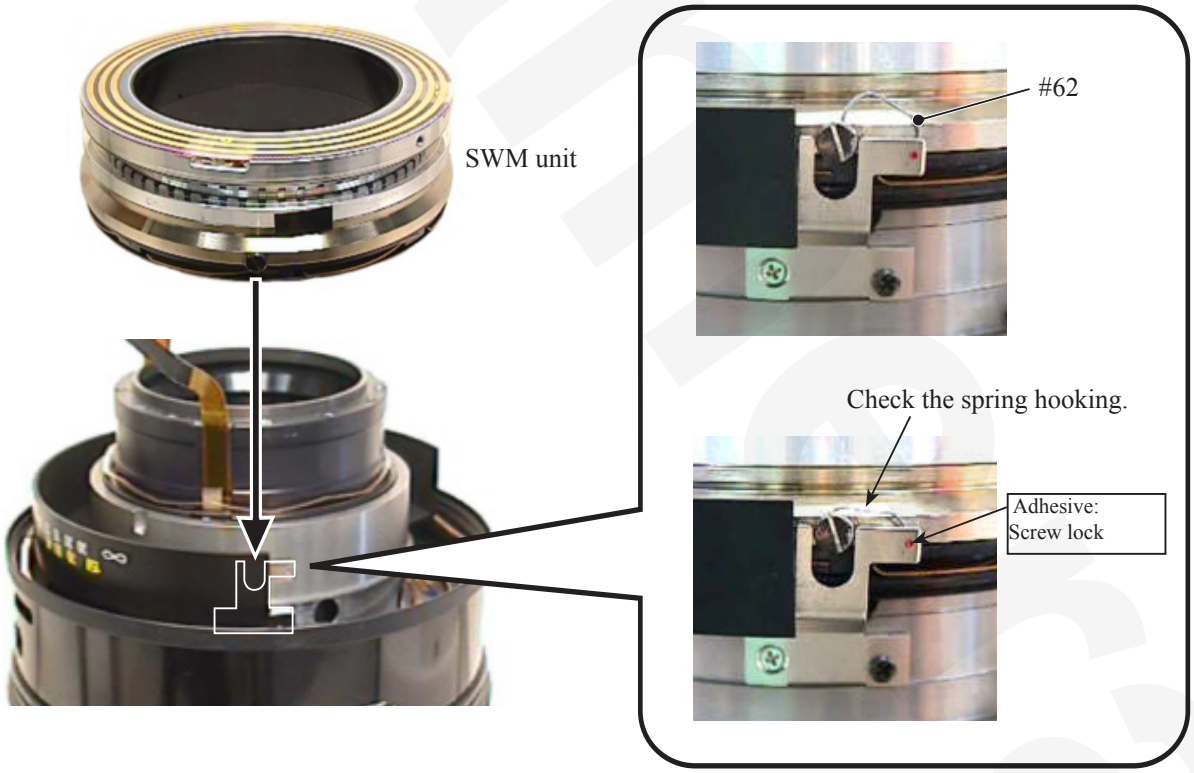


Check the height of the wave washer (#192).

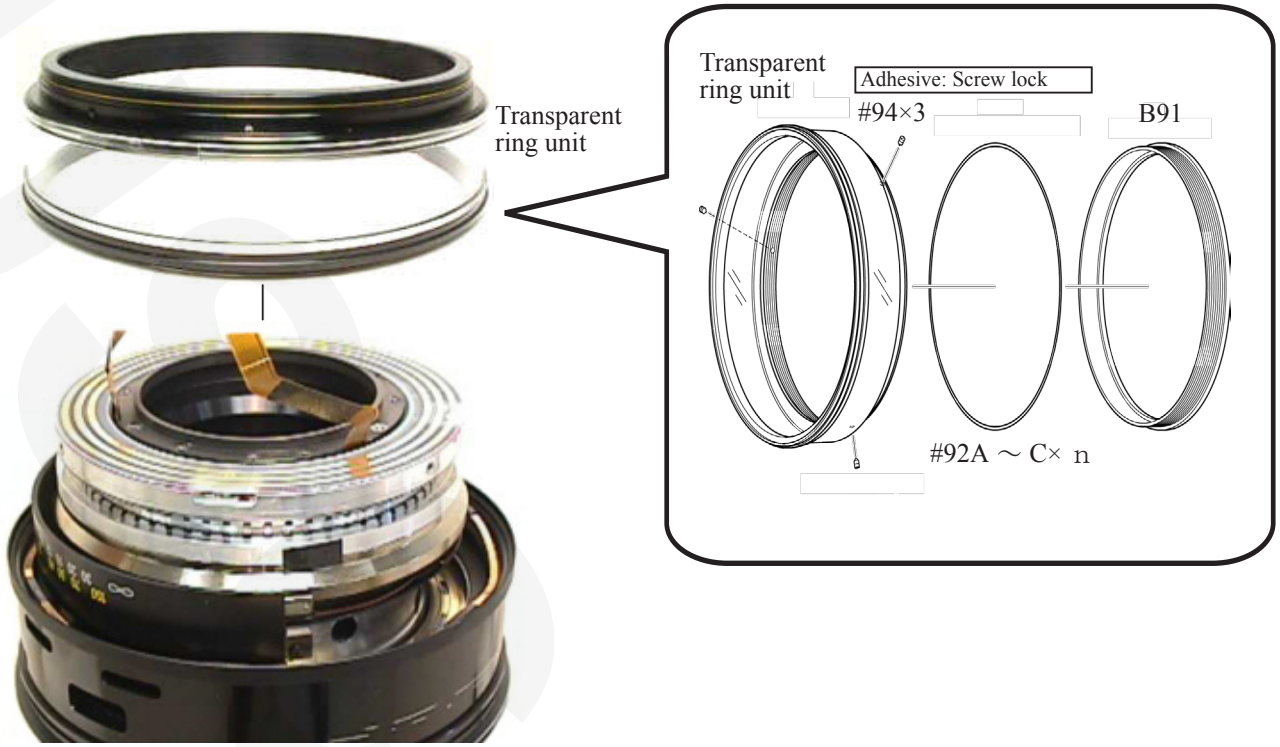


Temporary mounting of SWM unit

・Mount the SWM unit, and hook the SWM fixed spring (#62)



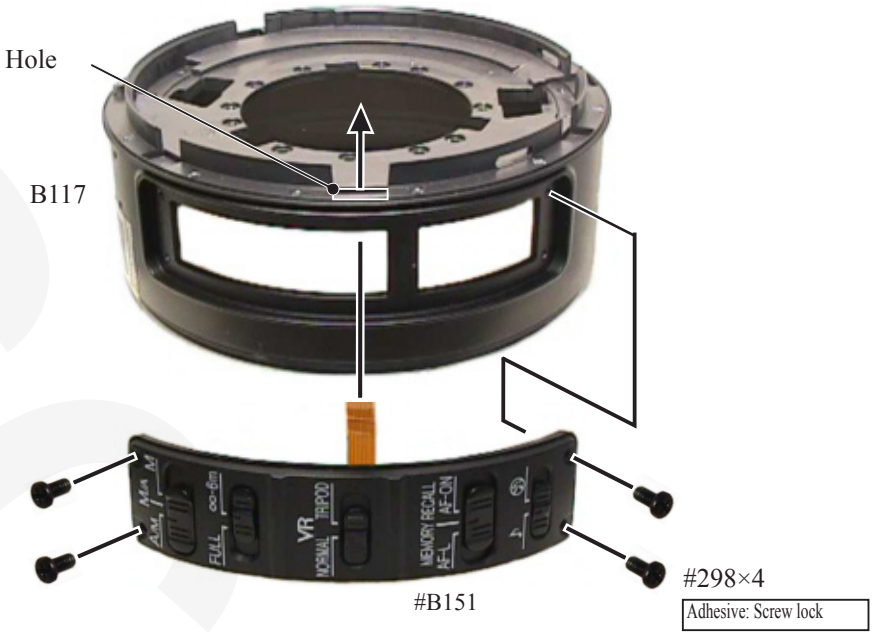
Inspection and Adjustment of Transparent ring movement



- Mount the transparent ring unit.
- Attach the three guide rollers (#108) temporarily with three screws (#104).
- Attach the SWM fixed tube unit (B117) temporarily with three screws (#241).
- Check that when the MF ring is rotated slowly, the focus index ring subsequently moves together and when it is rotated all the way to end, the only MF ring runs idle.
- In case defects are found, adjust by the washer (#92 selected from A to C) or check the height of the wave washer unit B82 (Page A13).
- When the inspection or adjustment is completed, take out the three screws (#241) and remove the SWM fixed tube unit (B117).
- Apply the adhesive (L-241) to the three screws (#104) and tighten them again.

Change SW unit

・Pass the FPC part of the change SW unit (B151) through the hole of the SWM fixed tube unit (B117), and tighten four screws (#298).



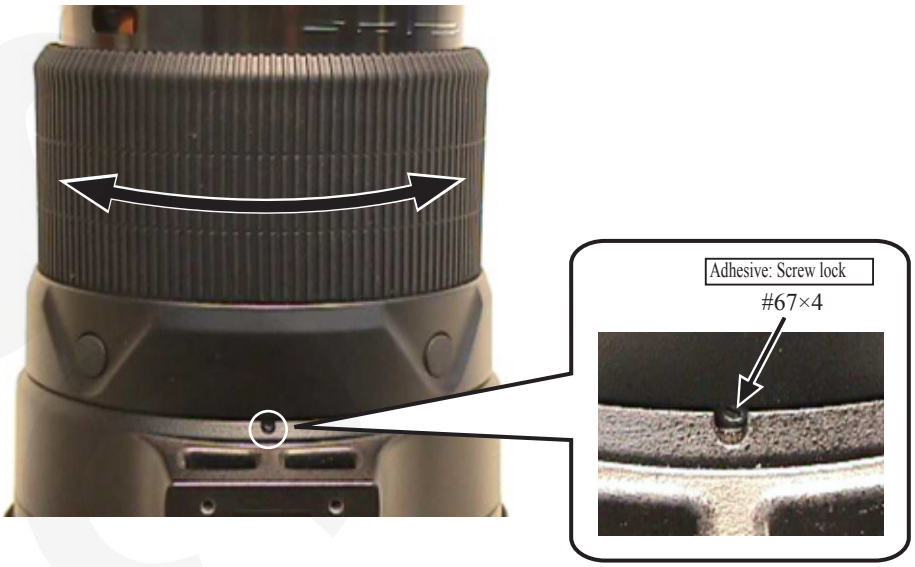
SWM fixed tube unit

・Pass the two FPCs of the fixed tube unit through the inside hole of the SWM fixed tube unit.

・Attach the SWM fixed tube unit with twelve screws (#241). [Three of the screws (#241) are attached temporarily as described on Page A15.)

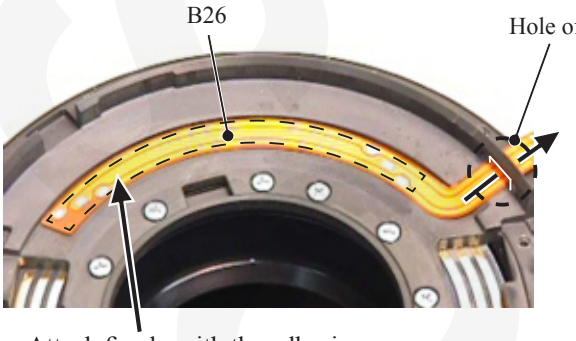
Caution: Do NOT apply "L-241" to [Screw for GND].

・Loosen the four screws (#67) that were temporarily attached on Page A12. Then, check the operation of the MF ring and tighten four screws (#67).

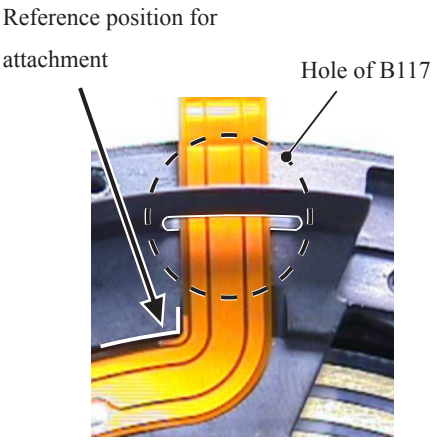


SWM power FPC unit

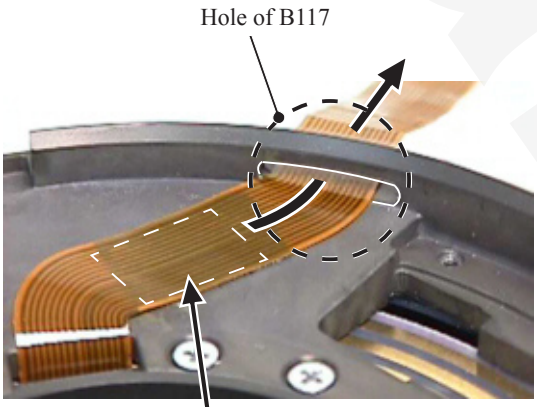
- Attach the SWM power FPC unit (B26) to the SWM fixed tube unit (B117) based on the reference position.
- Pass the head of the SWM power FPC unit (B26) from the inside to the outside through the hole of the SWM fixed tube unit (B117) .



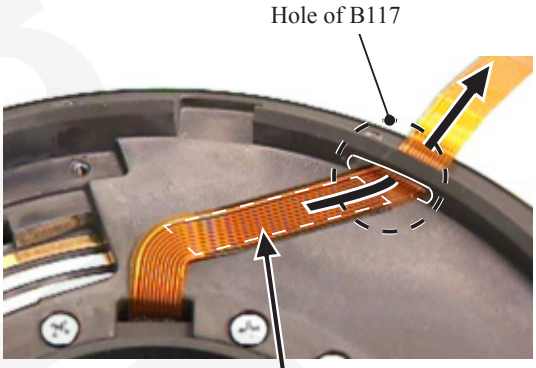
Attach firmly with the adhesive double-coated tape.



- Attach the FPC of the fixed tube unit to the SWM fixed tube unit (B117).
- Pass the head of the FPC from the inside to the outside through the hole of the SWM fixed tube unit (B117).



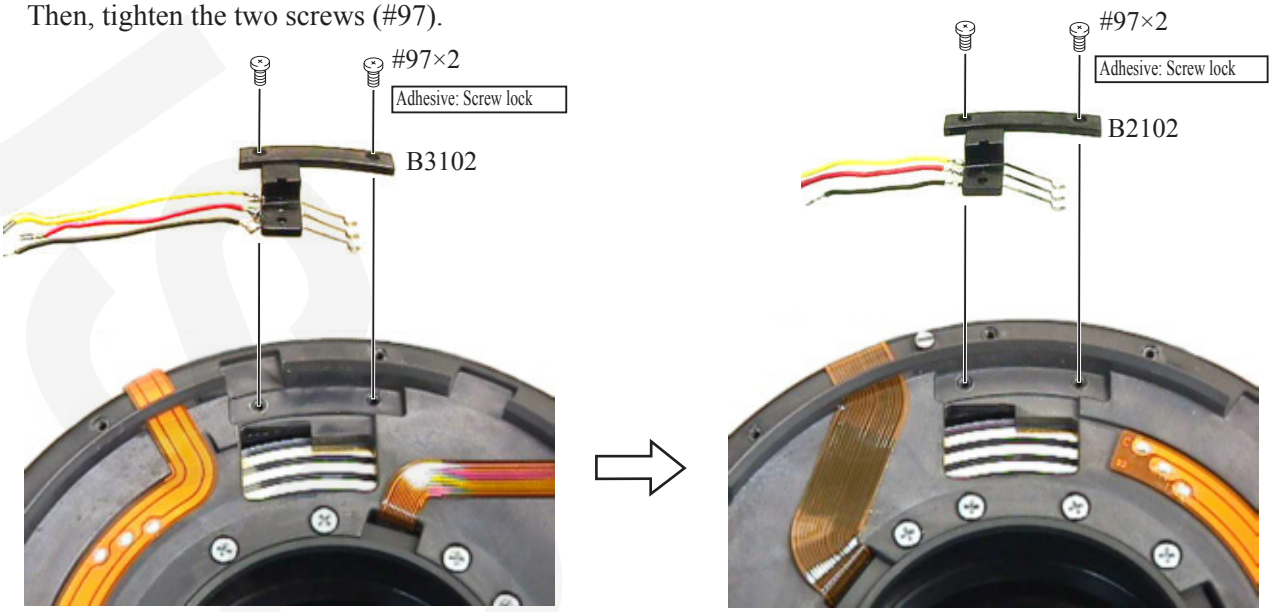
Attach firmly with the adhesive double-coated tape.



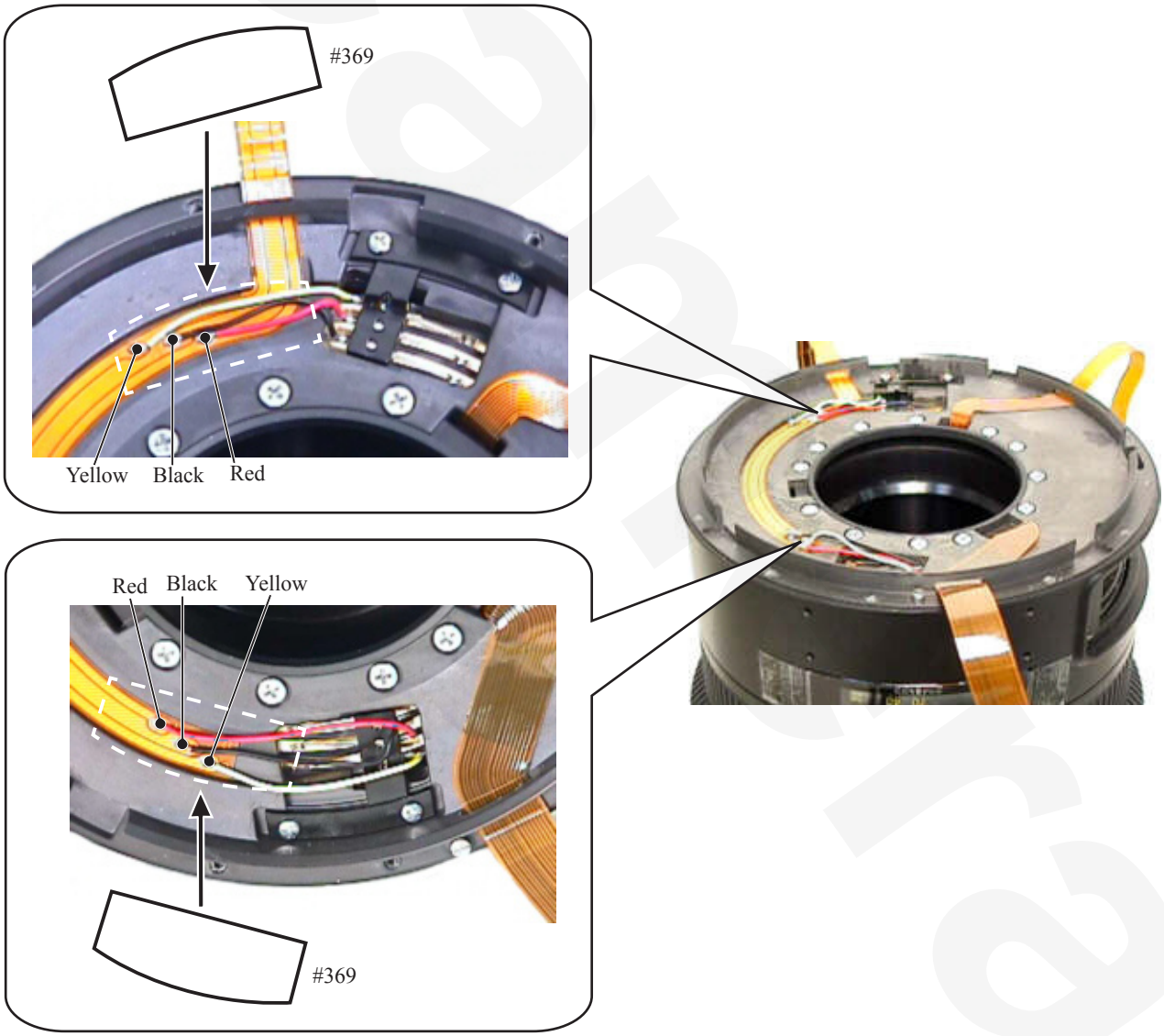
Attach firmly with the adhesive double-coated tape.

Power brush unit 1, 2

・Mount the power brush unit 1（B2102）and 2 (B3102) on the SWM fixed tube unit (B117).
Then, tighten the two screws (#97).

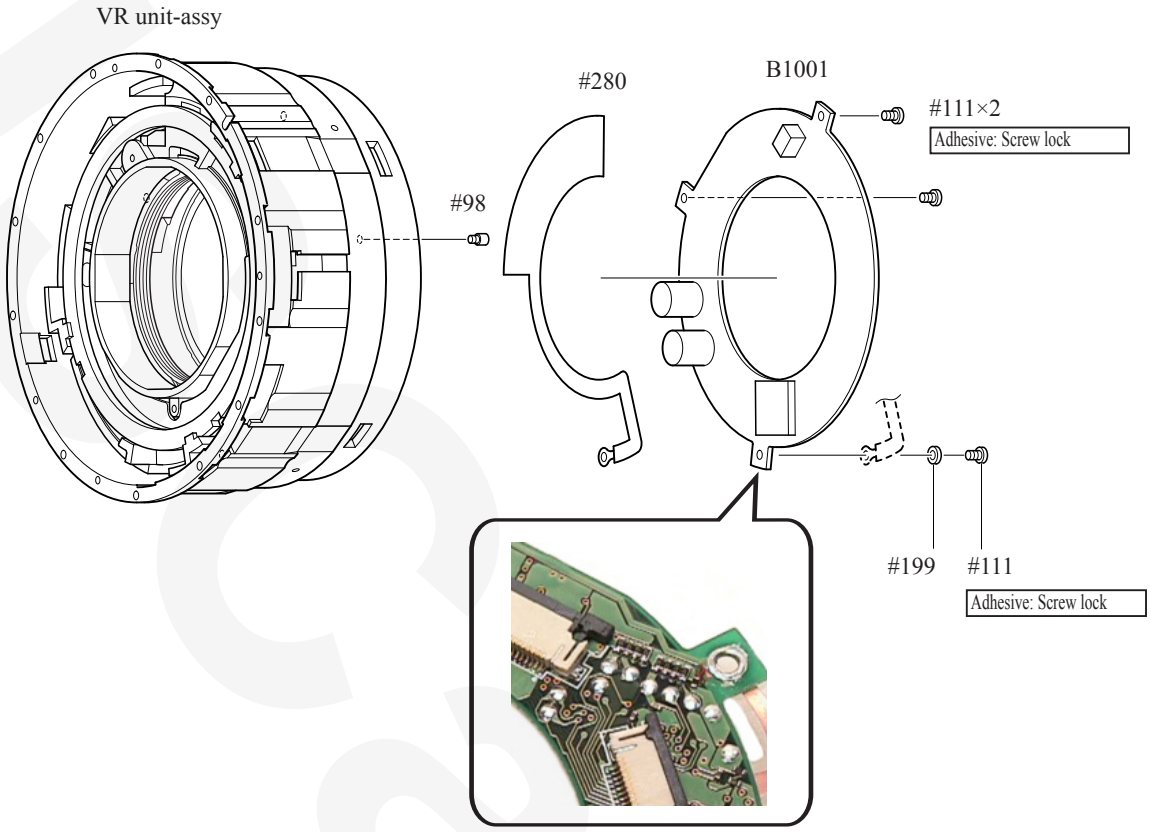


・Solder the six wires of the power brush unit 1 (B2102) and 2 (B3102) on the SWM power FPC unit (B26).

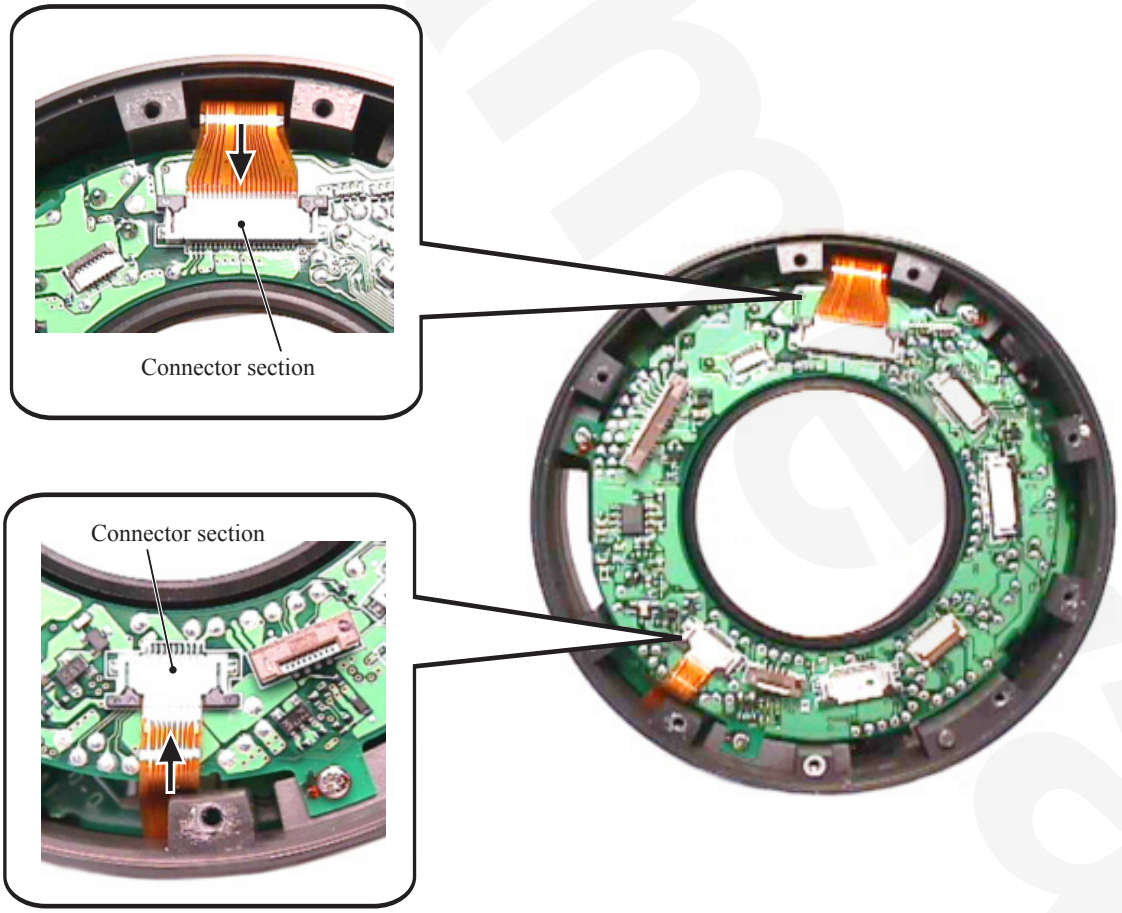


VR unit-assy

・Mount the main PCB (B1001) and shield (#280) on the VR unit-assy. Put the washer (#199) and tighten three screws (#111).

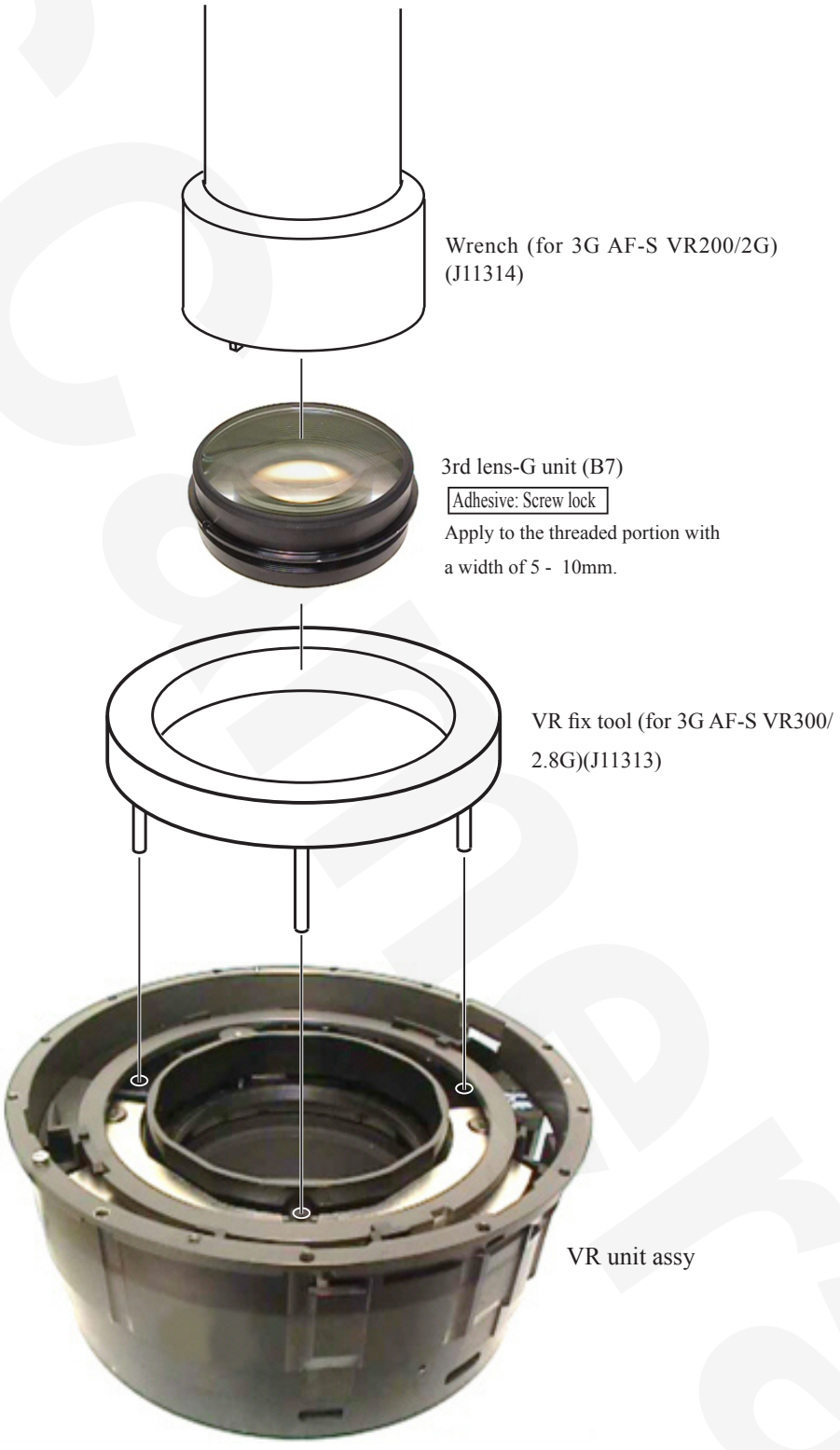


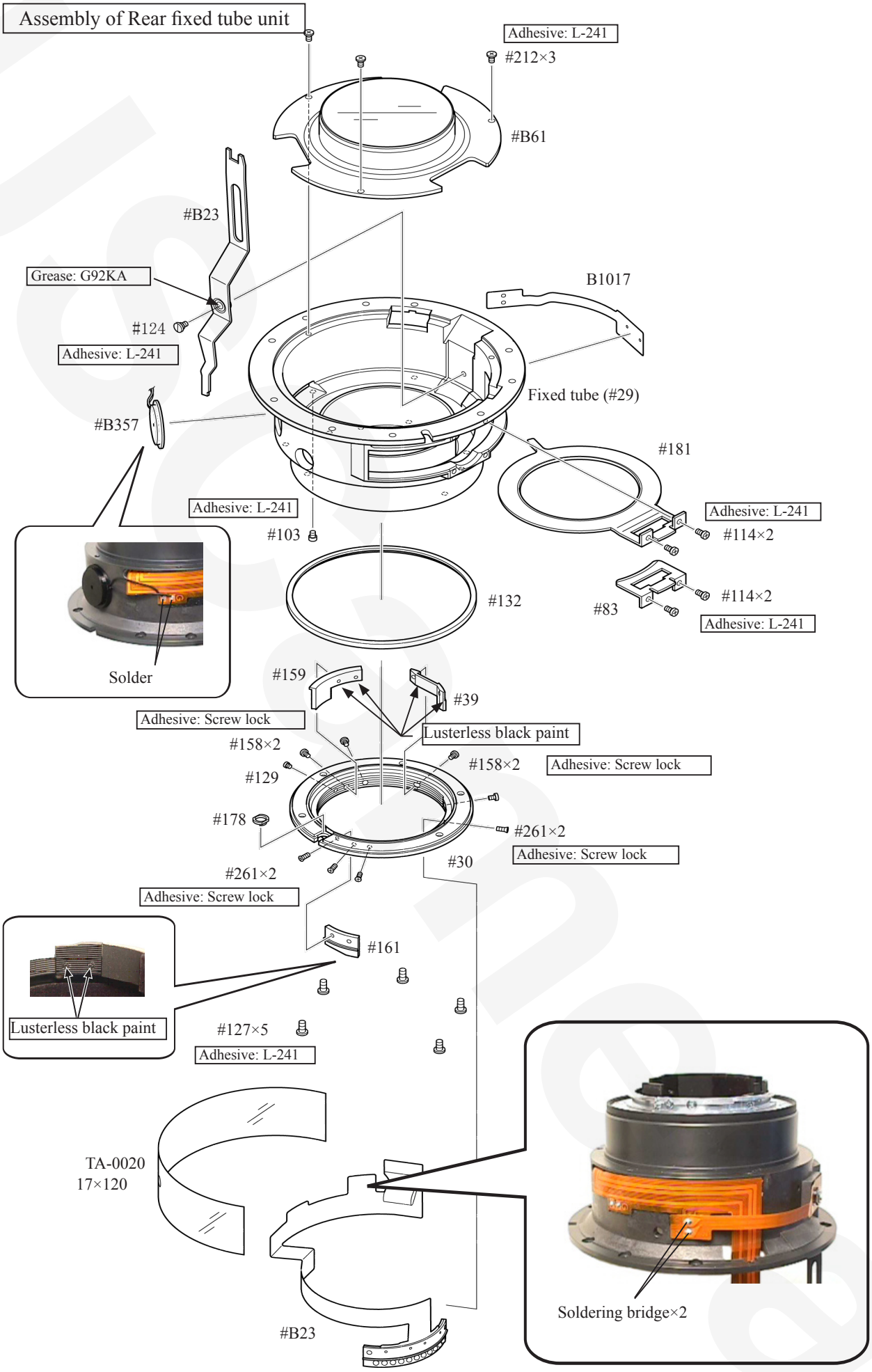
・Connect the FPC to the connector section of the VR unit-assy.



3rd lens-G unit

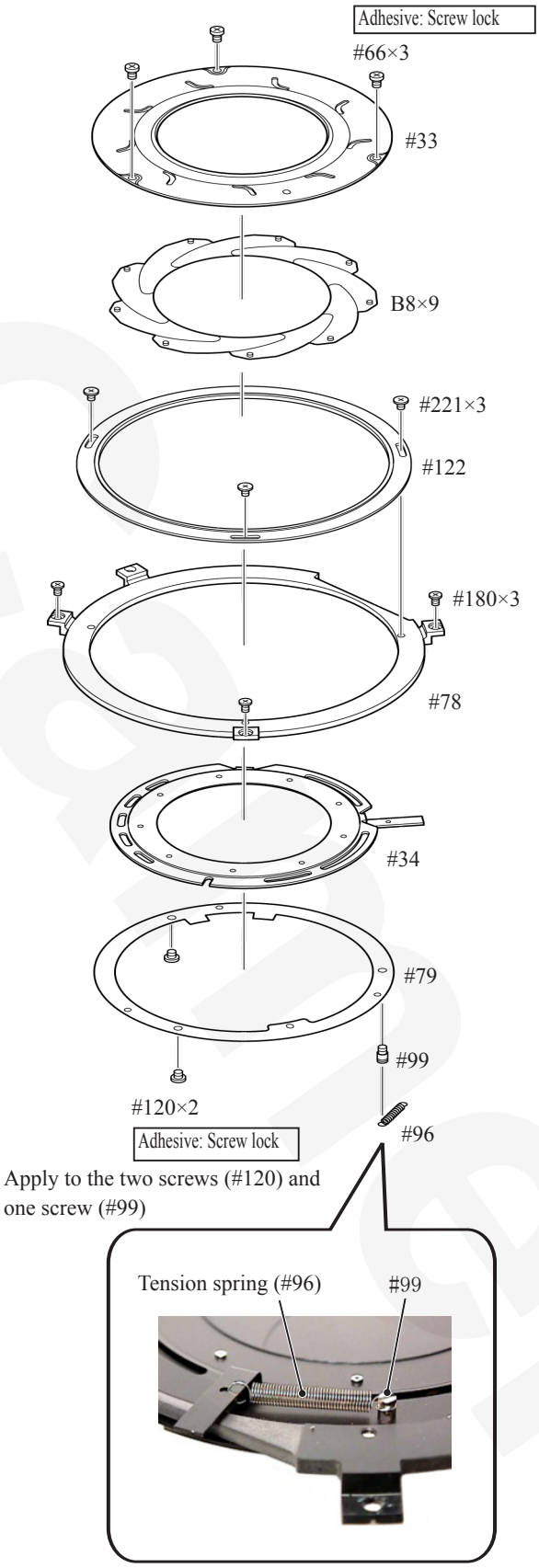
- Set the VR fix tool (J11313) to the VR unit-assy.
- Apply the screw lock with a width of approx. 5-10 mm to the threaded portion of the 3rd lens-G unit (B7).
- Set the 3rd lens-G unit (B7) with the wrench (for 3G AF-S VR200/2G)(J11314), and mount them on the VR unit-assy.
- Remove the VR fix tool (for 3G AF-S VR300/2.8G)(J11313) from the VR unit-assy.



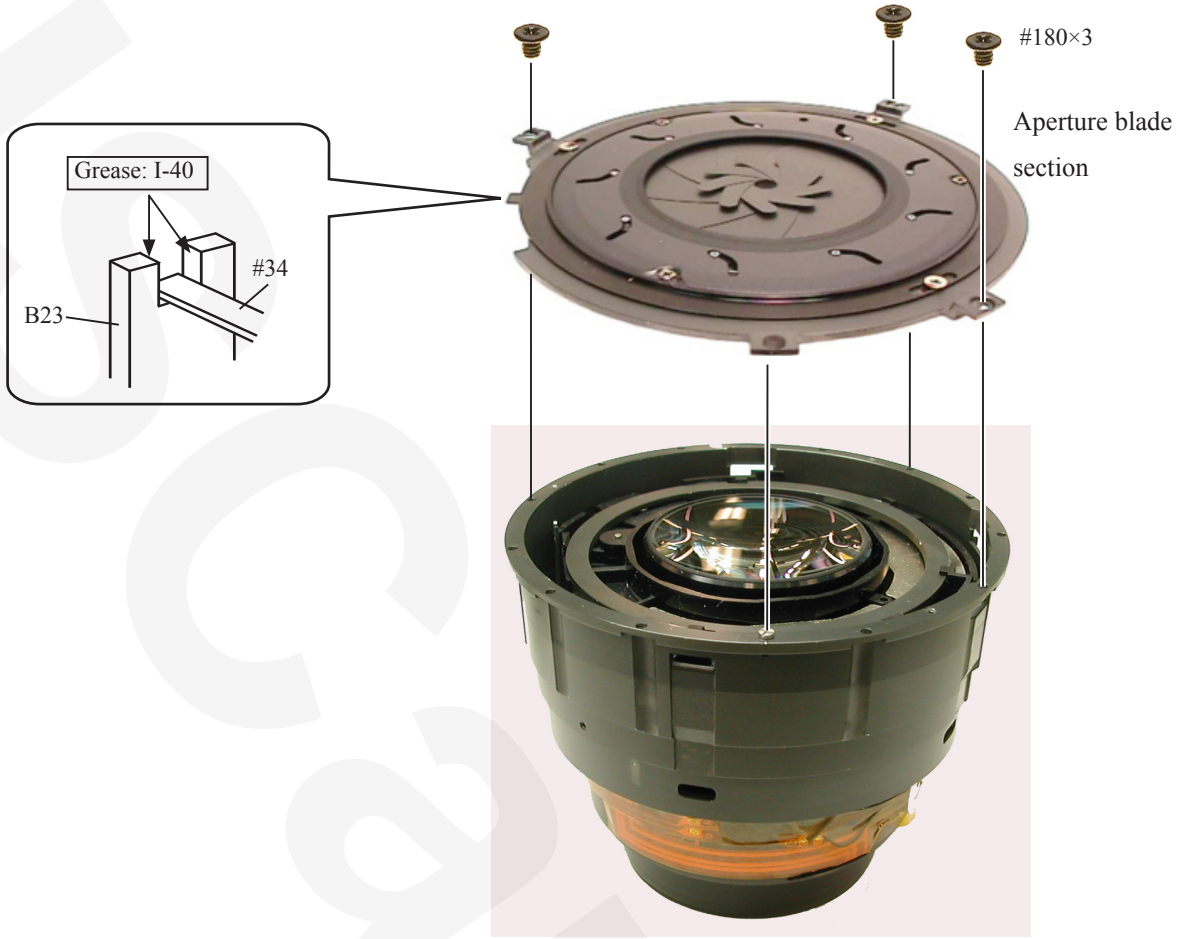

Assembly of Rear fixed tube unit
Adhesive: L-241
#212×3
#B61
#B23
Grease: G92KA
#124
Adhesive: L-241
B1017
Fixed tube (#29)
#B357
#181
Adhesive: L-241
#114×2
Adhesive: L-241
#103
#132
#83
#114×2
Adhesive: L-241
Solder
#159
#39
Adhesive: Screw lock
Lusterless black paint
#158×2
#158×2
Adhesive: Screw lock
#129
#178
#261×2
Adhesive: Screw lock
#30
#261×2
Adhesive: Screw lock
#161
Lusterless black paint
#127×5
Adhesive: L-241
TA-0020
17×120
#B23
Soldering bridge×2

Aperture blade

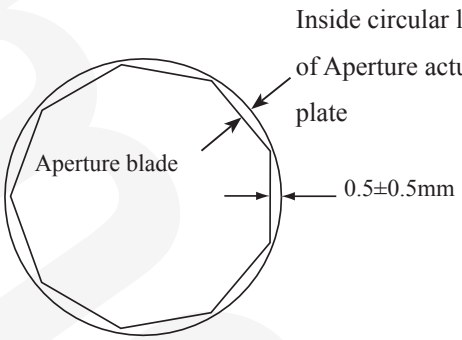
・Assemble the aperture blade section.

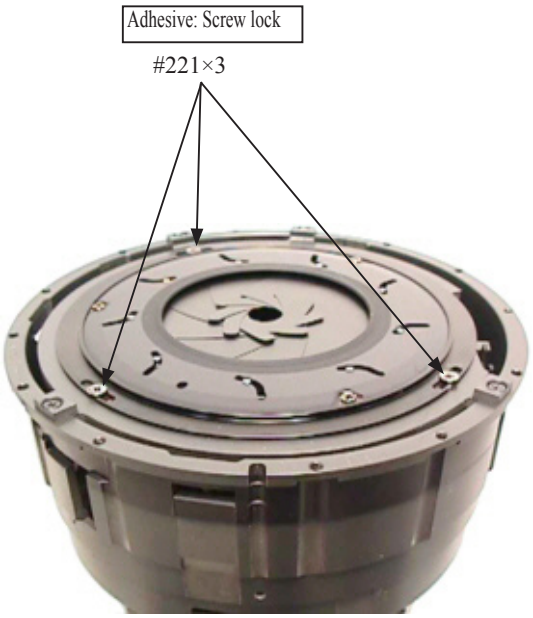


・Mount the aperture blade section.



Adjustment of Aperture diameter





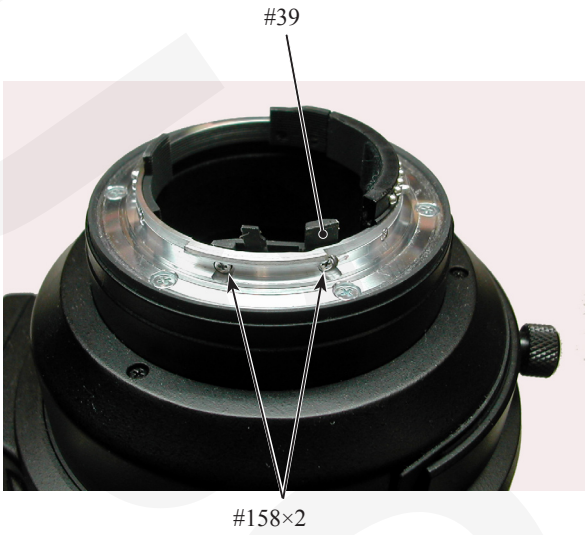
・Move the aperture lever so that it is set to full aperture.

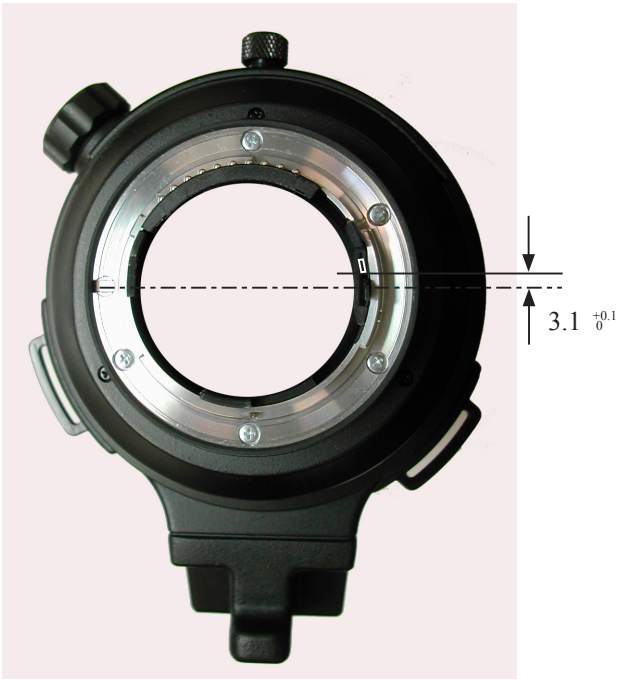
・Loosen the three screws (#221) and turn the aperture unit to adjust the aperture diameter.

Standard: All the aperture blades must be positioned leaving space of 1mm ± 0.2mm in the largest part from the blade's edge to the inside circular line of the aperture actuating plate.

・After the adjustment, apply Screwlock on three screws (#221).

Position adjustment of Aperture lever





・Measure the 3.1-lever. Loosen the two screws (#158) and move #39 so that the above width becomes 3.1 $^{+0.1}_{0}$

Adjustment of Aperture diameter

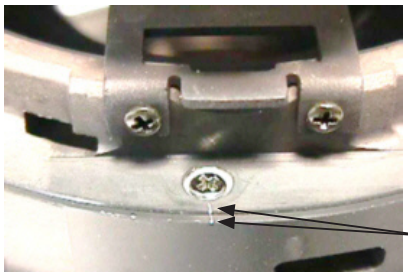
1. Prepare adjustment of Aperture diameter

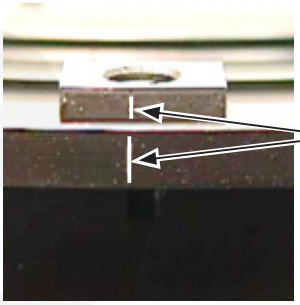
・Mount the rear fixed-tube unit on the VR unit, then attach them temporarily with three screws (#105).

Note:
The FPC that connects from the rear fixed-tube unit is temporarily attached, without being inserted into the connector. When assemble the above, be careful not to pinch, etc, the FPC.

Removal of VR unit-assy from Rear fixed tube unit

・ After the adjustment, make a mark-off line. Then remove the temporarily-attached 3 screws (#105) and detach the VR unit-assy from the rear fixed-tube unit.

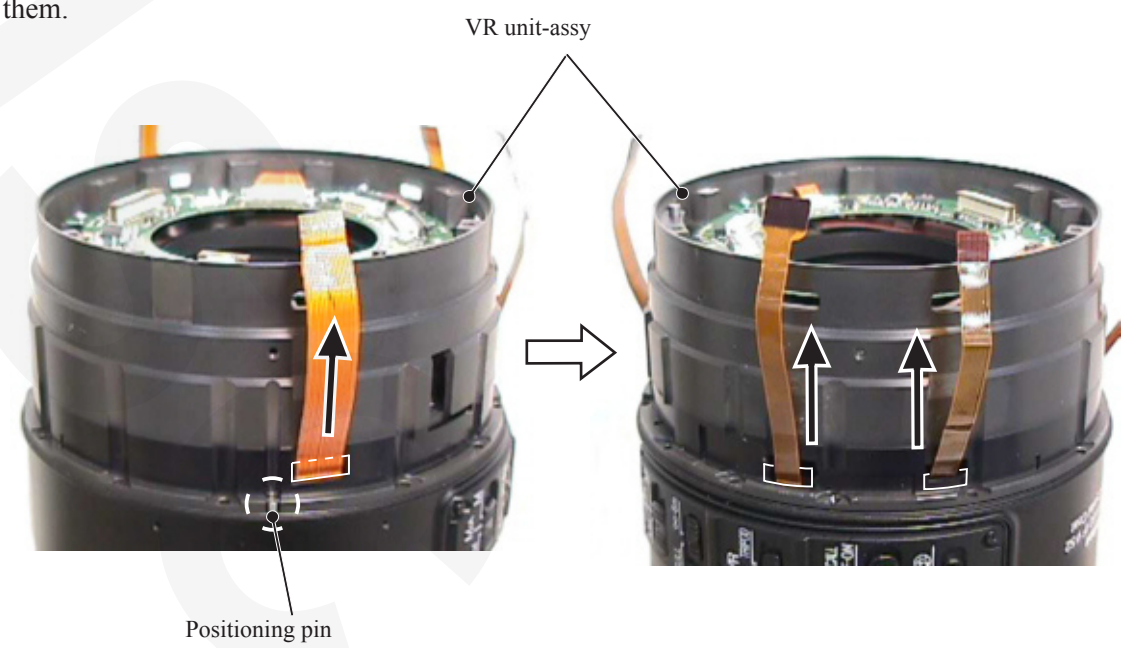




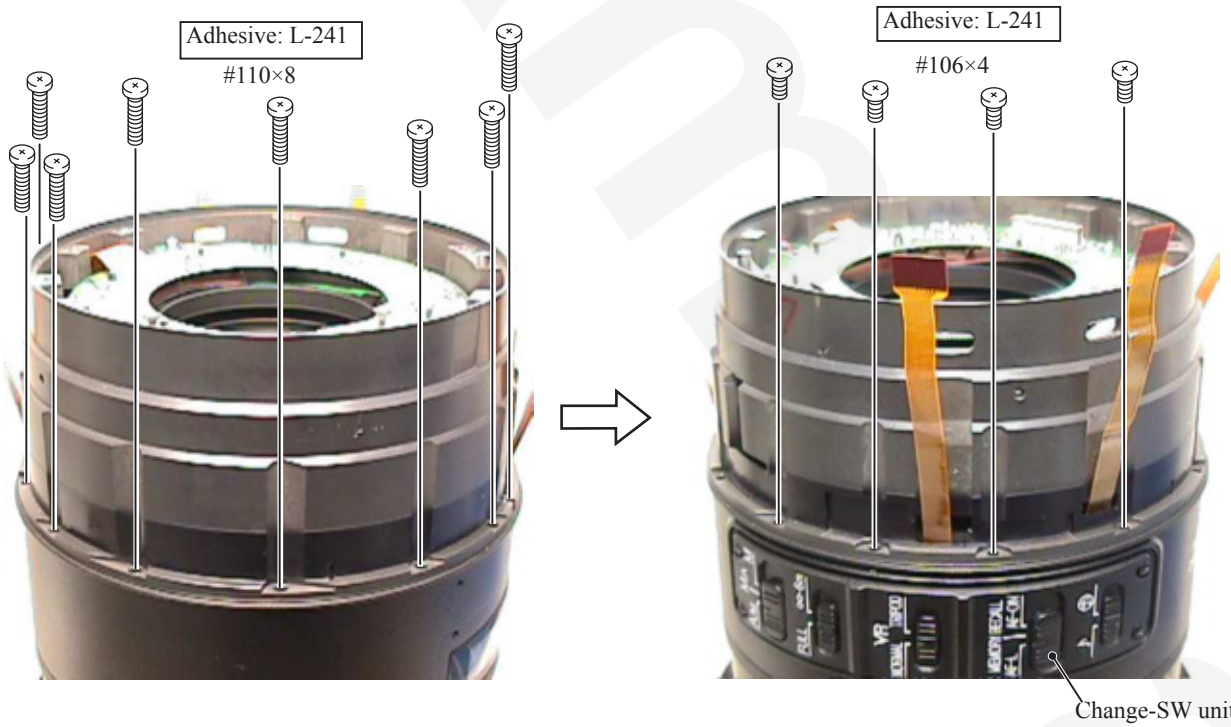
Note:
Do not put the unit with the aperture blade side's face down on a desk, etc, otherwise it may cause a deformation of the aperture blade unit.

VR unit-assy

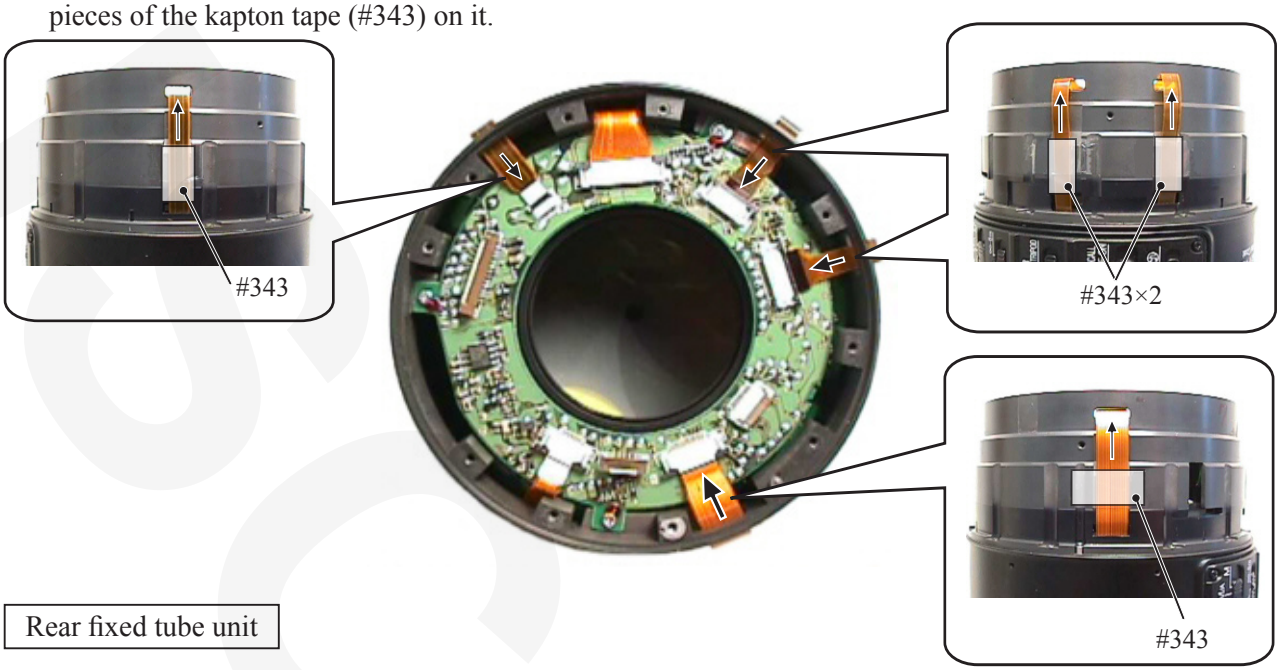
・Pass each FPC, which connects from the body, through holes of the VR unit-assy to assemble them.



・Attach the VR unit-assy firmly with eight screws (#110), and the change-SW unit with four screws (#106).

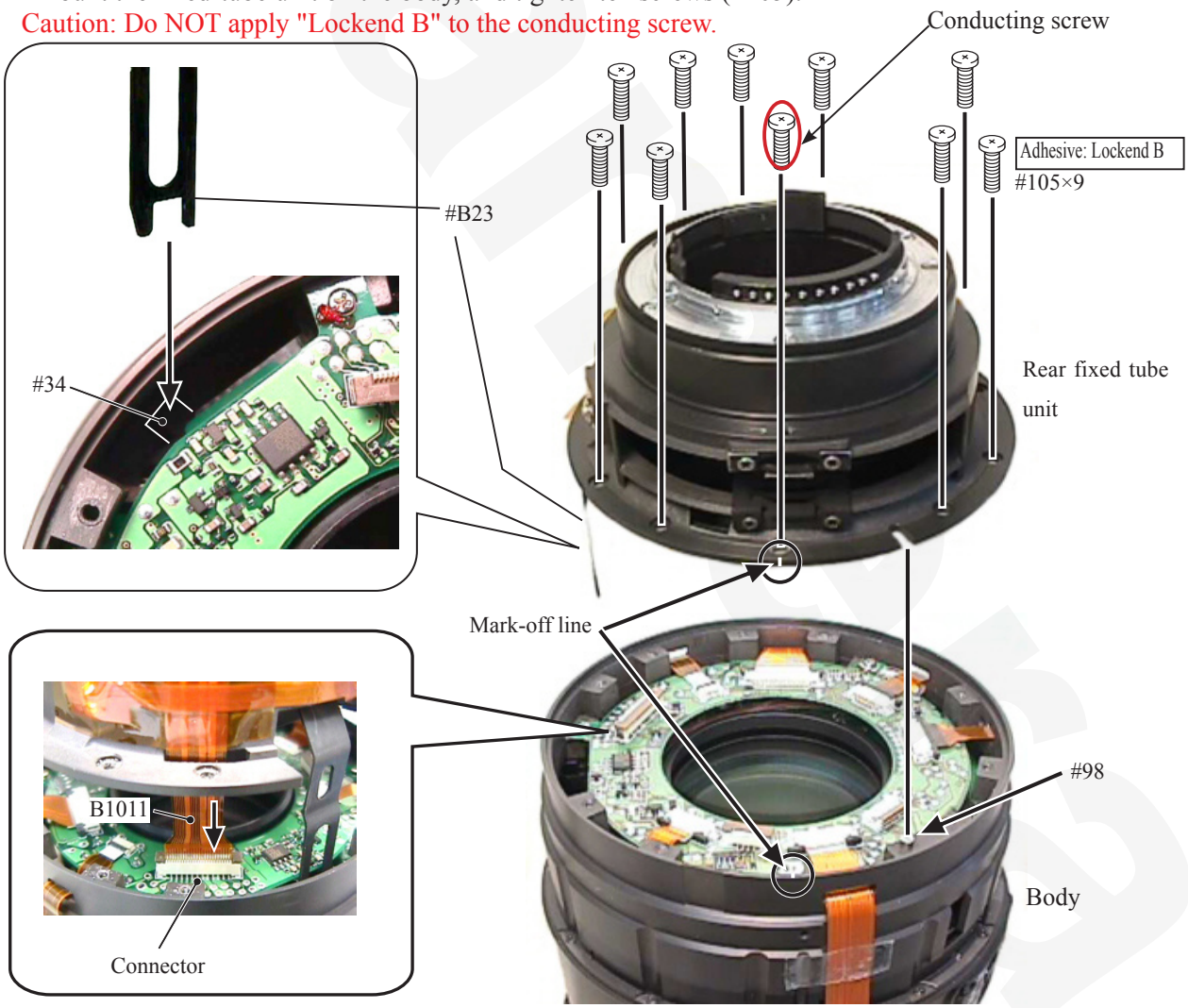


- Pass each FPC through the holes of the VR unit, and connect them to each connector of the main PCB unit.
- While confirming that the FPC does not become slackened, attach four pieces of the kapton tape (#343) on it.



- Connect the FPC (B1011), which is connected from the rear fixed-tube unit, to the connector of the main FPC.
- Mount the fixed-tube unit on the body, and tighten ten screws (#105).

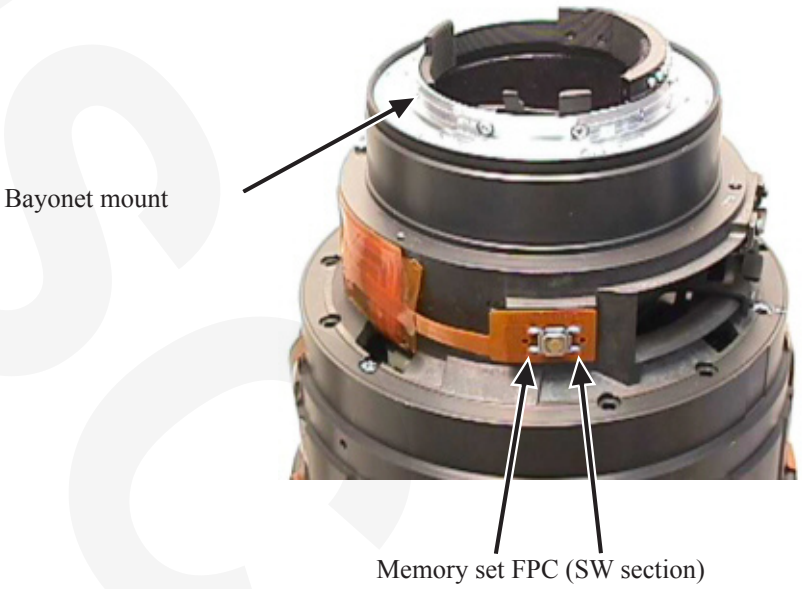
Caution: Do NOT apply "Lockend B" to the conducting screw.



Electrical continuity check of GND line

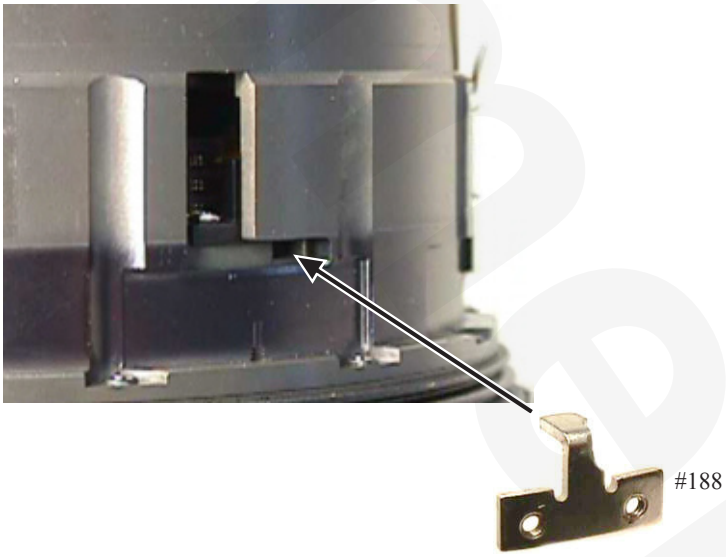
・Check the electrical continuity of GND line between the bayonet mount and the memory set FPC (SW).

Standard: 1.0 Ω or less



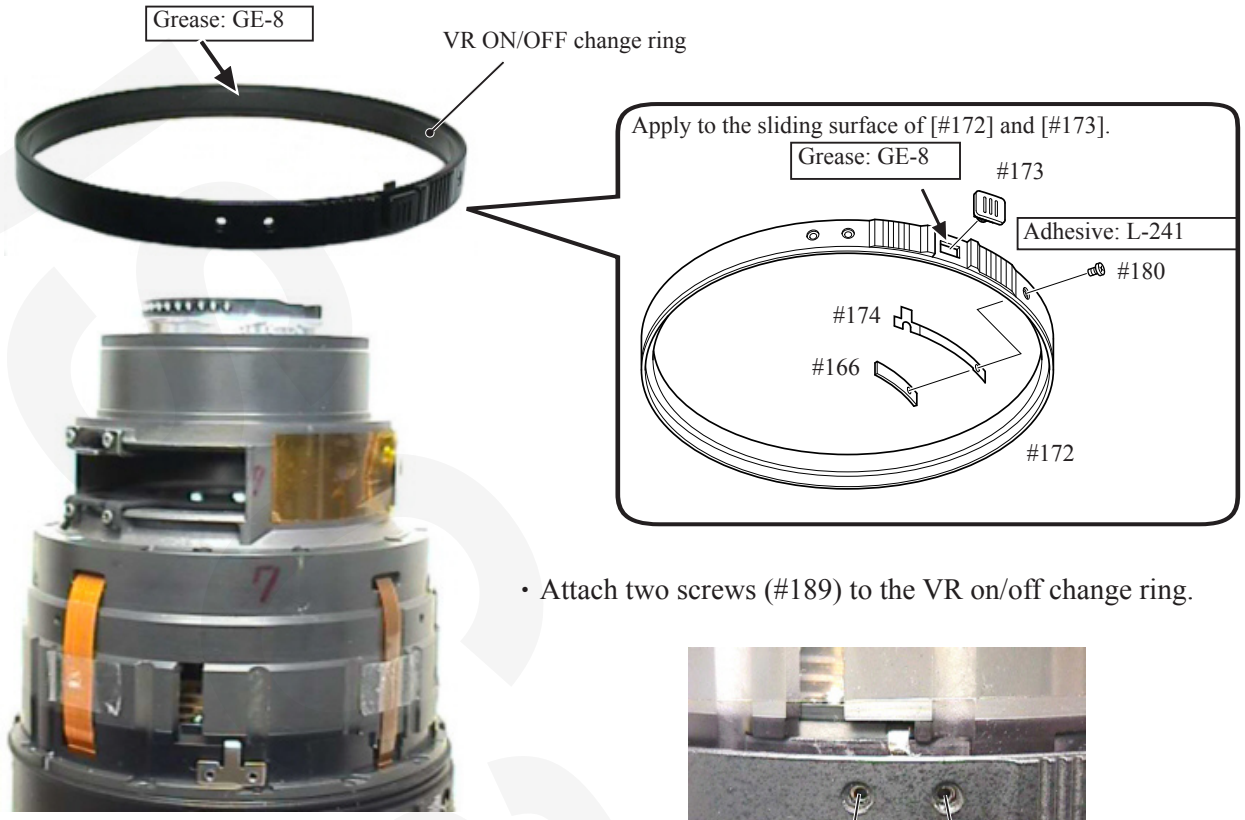
VR ON/OFF change ring

・Put the lock ring connecting key (#188) into the hole of the VR unit.

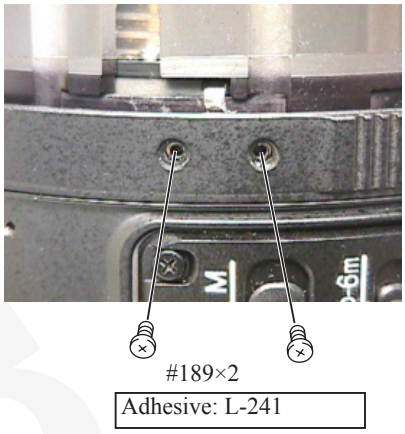


・Mount the VR ON/OFF change ring.

Apply to the overall sliding surface of the inside of the ring.

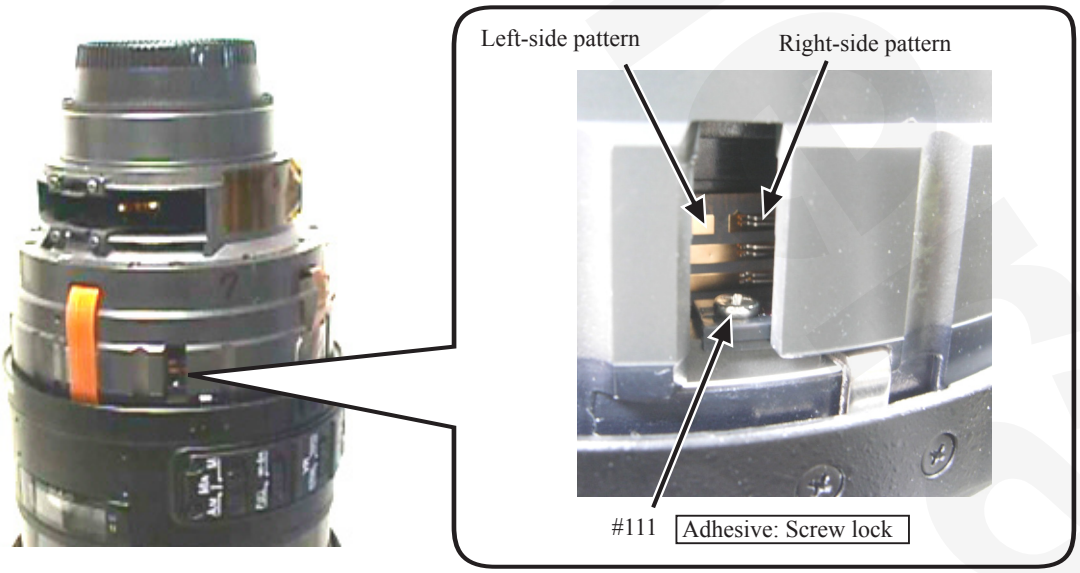


・Attach two screws (#189) to the VR on/off change ring.



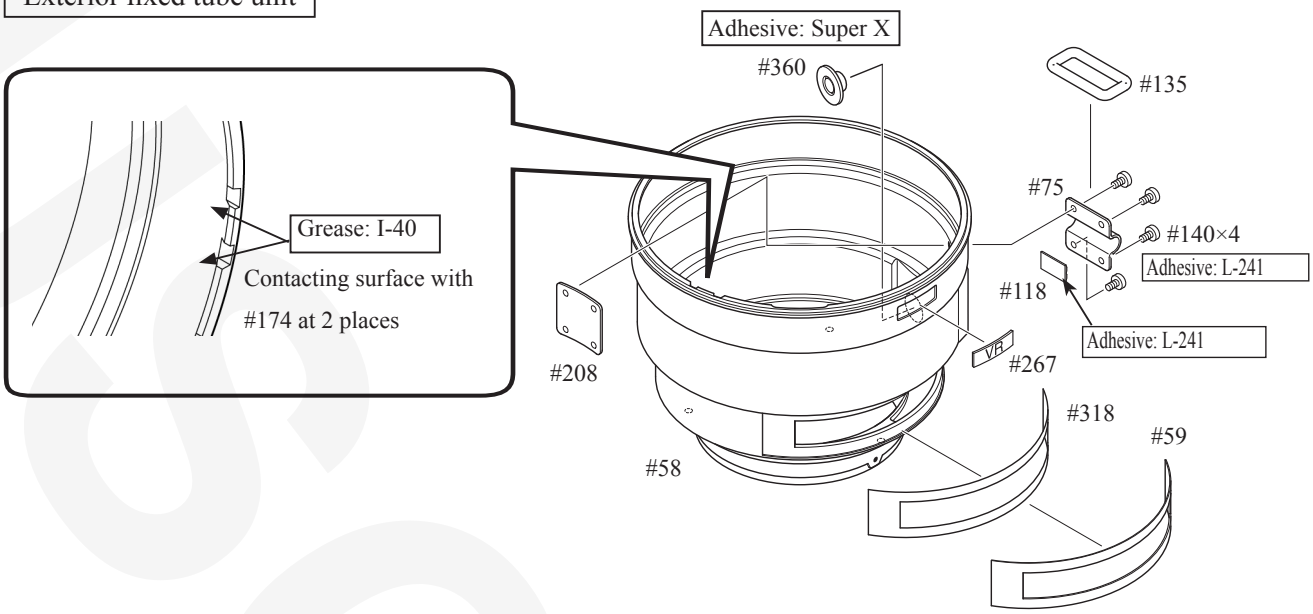
Position adjustment of VR change brush

・Set the VR-on/off ring to ON, and adjust by the screw (#111) so that the brush surely touches the right-side pattern of the PCB.



Tripod base

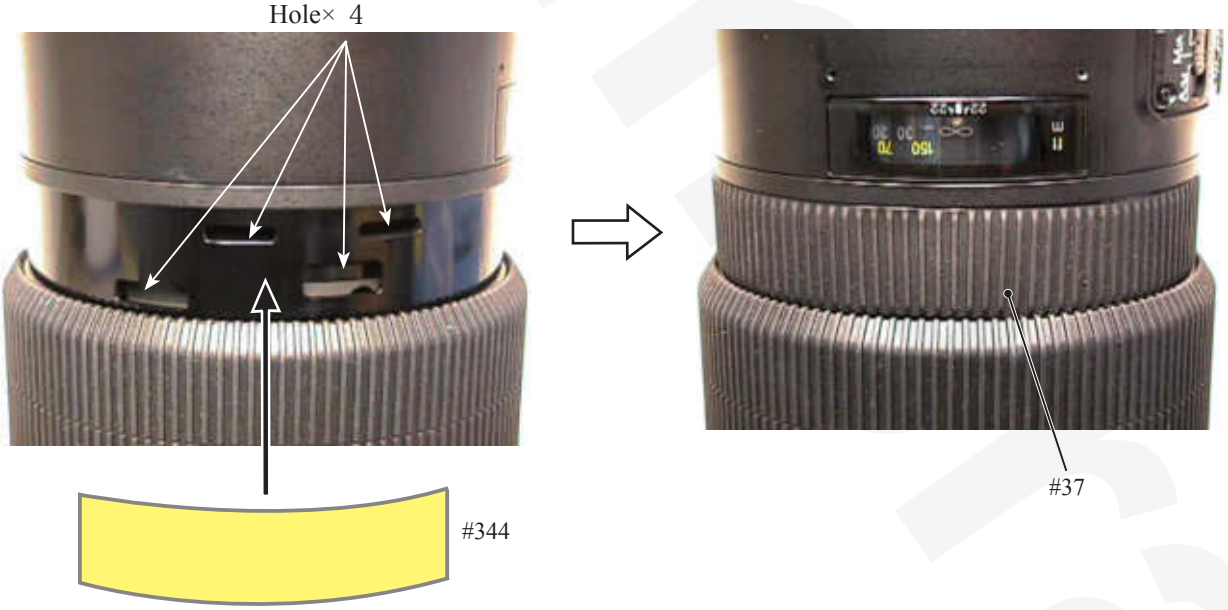
Exterior fixed tube unit



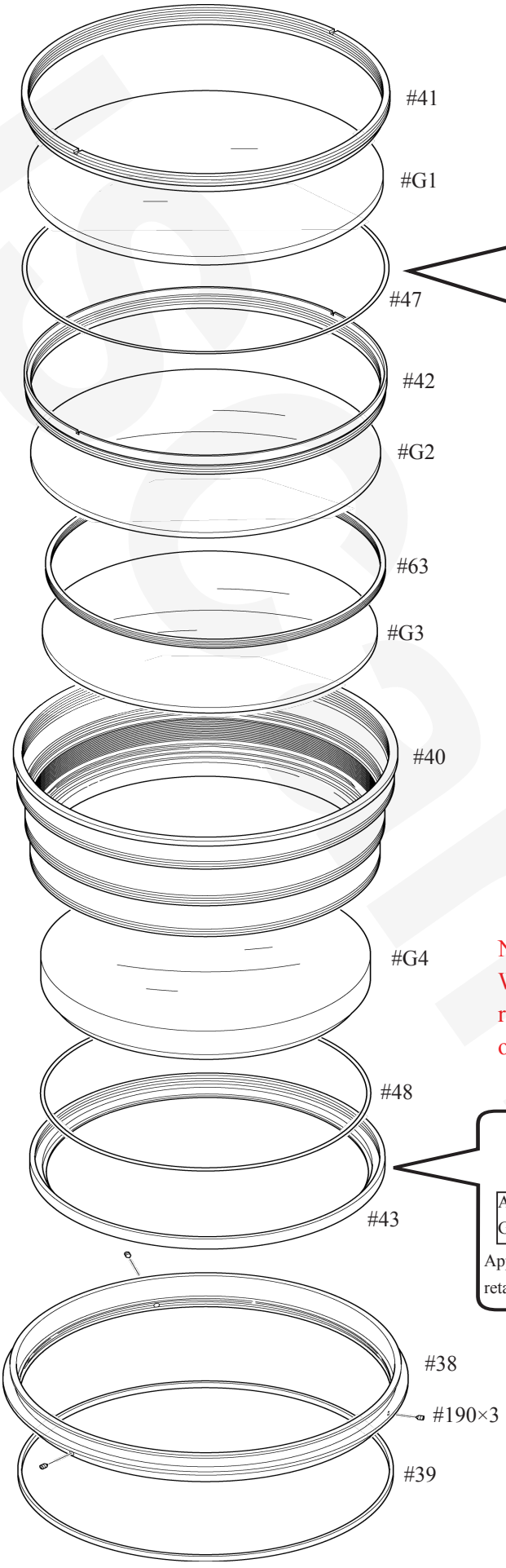
Insertion filter

MF ring small rubber

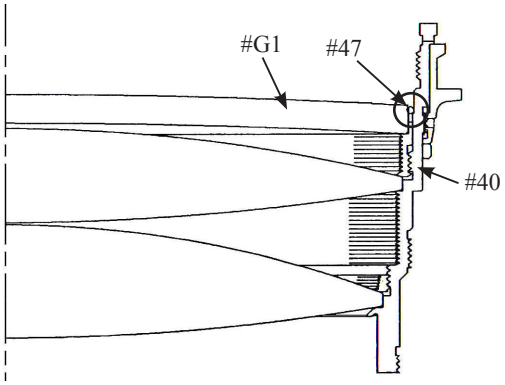
・Attach the tape (#344) to cover the four holes of the MF ring unit, and install the MR ring small rubber (#37).



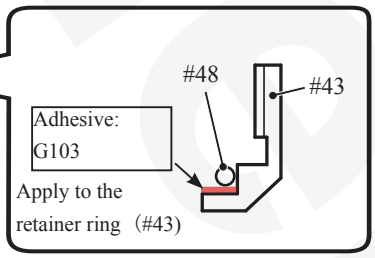
1st lens-G unit



While pushing the drip-proof rubber (#47) into the clearance between the G1 lens and the lens housing (#40) with stickers, etc, make an assembly.



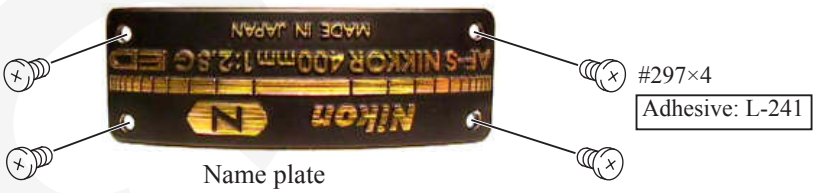
Note:
When the vinyl electric wire (#48) is replaced, tighten the retaining ring (#43) once, then in a few minutes, retighten it.



2nd lens group, 1.5th lens-G unit, 1st lens-G unit

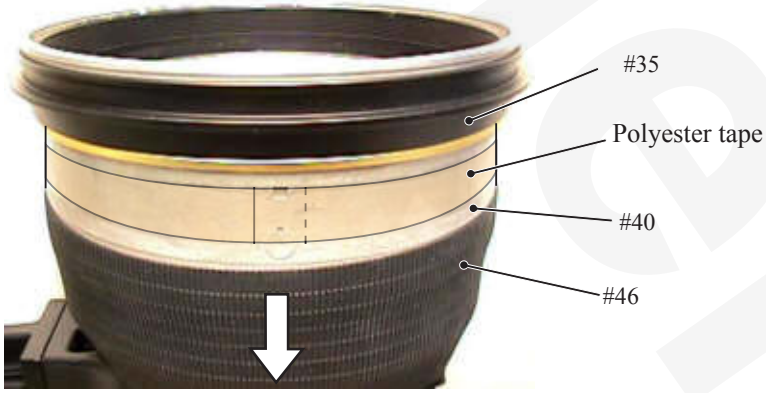
- Set the focus ring to the closest-distance.
- Put the 2nd lens group and spacing ring (#28) in the body.
- Fasten the focus drive section with the focus fixing pin. Then, mount the retaining ring (#49) with a wrench (J11351), and fix the 2nd lens group. Refer to Page 37 for how to fasten with the focus fixing pin.
- Mount the 1.5th lens group with a wrench (J11350).
- Assemble the 1st lens-G unit and the 1st lens-G head rubber.

Name plate



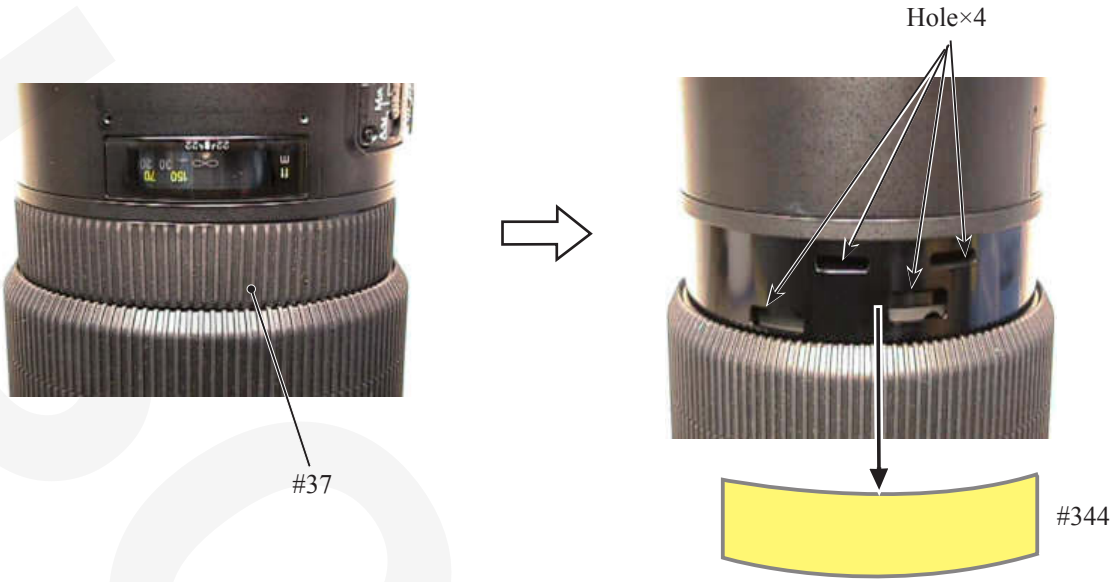
Polyester tape

・Pull down the rubber ring (#46). Attach the polyester tape around the lens housing (#40) and the front fixed tube (#35), then pull up the rubber ring to the original position.



FFD adjustment

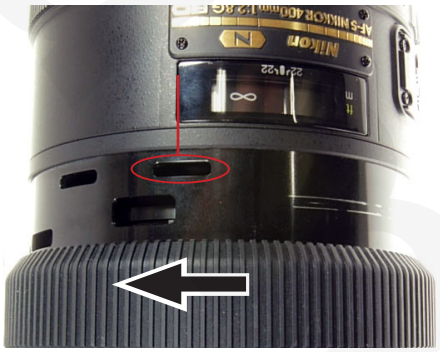
① Remove the MF-ring small rubber (#37), and peel off the tape (#344).



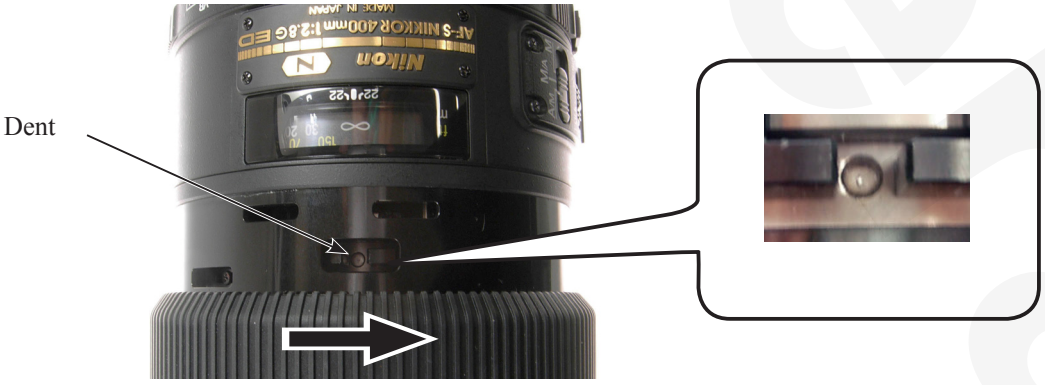
② Set up the lens on a tripod, etc.

③ Mount the infinity-focus reference body on the lens.

④ Rotate the MF ring up to the infinity-end, and position the hole of the MF ring unit as below.



⑤ Then, counterrotate the MF ring a little as shown so that the dent can be seen through the hole of the MF ring.



⑥ Insert the focus fixing pin (J11353) into the dent, and fix the position of the focus-drive section.

⑦ Confirm whether an object 100m-or-more distant is in focus.

If it is out of focus, go on to the below procedure for adjustments.

If it is in focus, go to Page A39 "Focus index position adjustment".

⑧ Remove the focus fixing pin (J11353) and loosen the three screws (#212) through the holes of the MF ring unit.

⑨ By following the procedure from ④ to ⑥ , fix the focus-drive section.

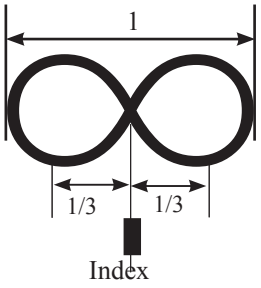
⑩ Move the focus fixing pin (J11353), and adjust the focus position.

⑪ At the time of coming into focus, tighten the above loosened three screws (#212).

⑫ Go on to "Focus index position adjustment".

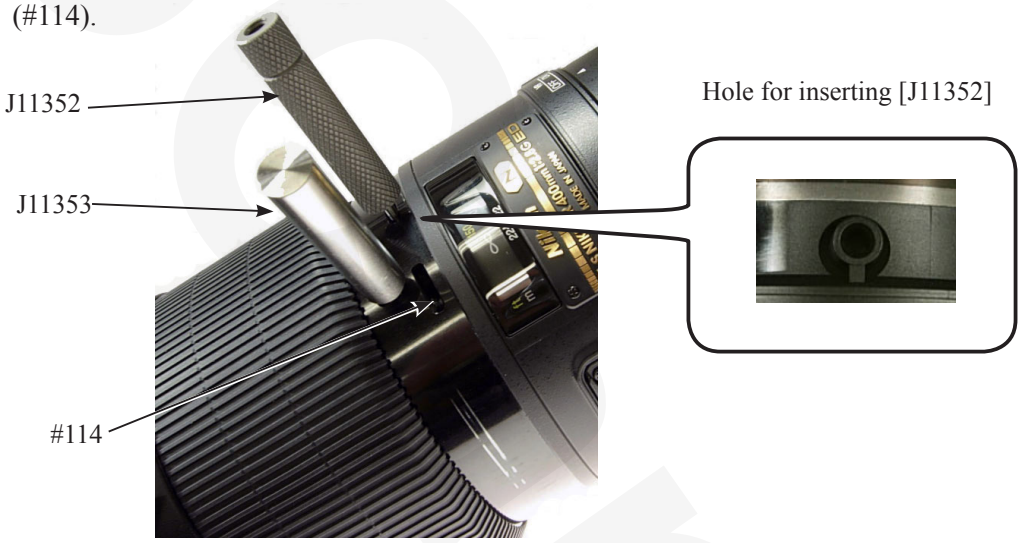
Focus index position adjustment

① If the index position is not within standard, go to the below procedure and adjust the focus index position.



Standard: Within the range of 2/3-width of the whole width of "∞"-mark (1/3 each right and left, from the center of "∞"-mark)

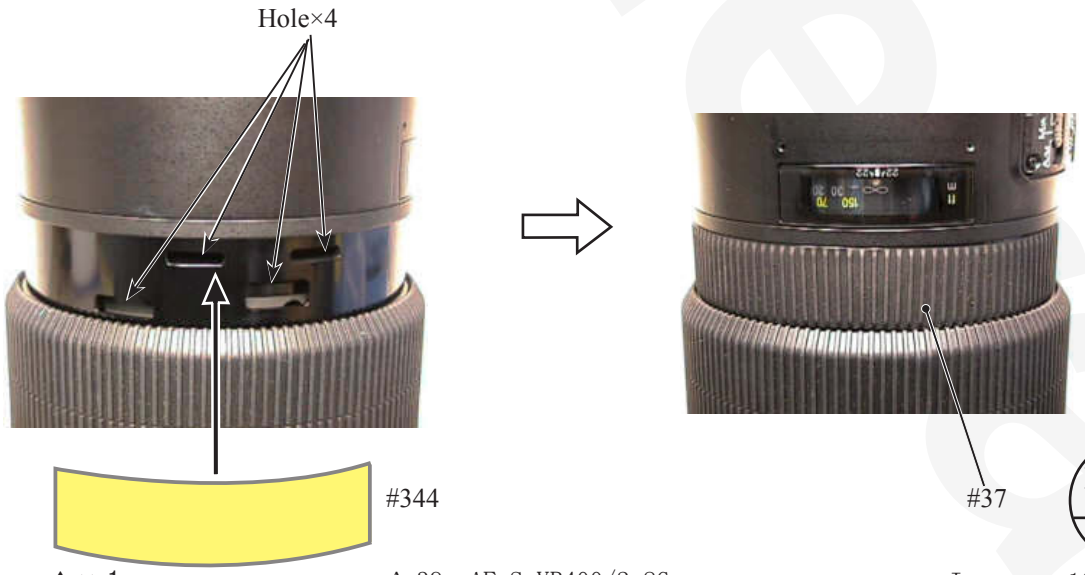
② Insert the focus index adjusting pin (J11352) into the hole as below and fix it. Then tighten the screw (#114).



③ Looking through the focus window, move the focus index adjusting pin (J11352) so that the index position must be within the range of 2/3-width of the whole width of "∞"-mark.

④ When the adjustment is completed, ~~loose~~ △ (Revision) tight the screw (#114). Then, remove the focus fixing pin (J11353) and the focus index adjusting pin (J11352).

⑤ Cover the four holes of the MF ring unit with the tape (#344). Then, set the MF ring small rubber (#37).



サービス計画課 M

Preparation for Inspection & Adjustment of Main PCB

● In case of replacing the main PCB, SWM unit or GMR unit and Fixed tube unit, be sure to make the necessary adjustments as follows:

1. Adjustments
   - Adjustment for electrical device (GMR duty adjustment, SWM offset adjustment, Focus preset adjustment)

2. Necessary device
   - Single output rated voltage power supply: 1 unit (6.0V 3.0A)
   - Oscilloscope: 1 unit Adjustment for electrical device (MR duty adjustment, drive frequency, and motor control adjustment)
   - AF-I communication box (J15306-1): 1 unit
   - AF-I communication adapter (J15307): 1 unit

● When the main PCB is replaced, be sure to perform "Writing of Fixed EEP-ROM fixed values" on Page A57.

AF-S VR 400 inspection and adjustment program (J18428)

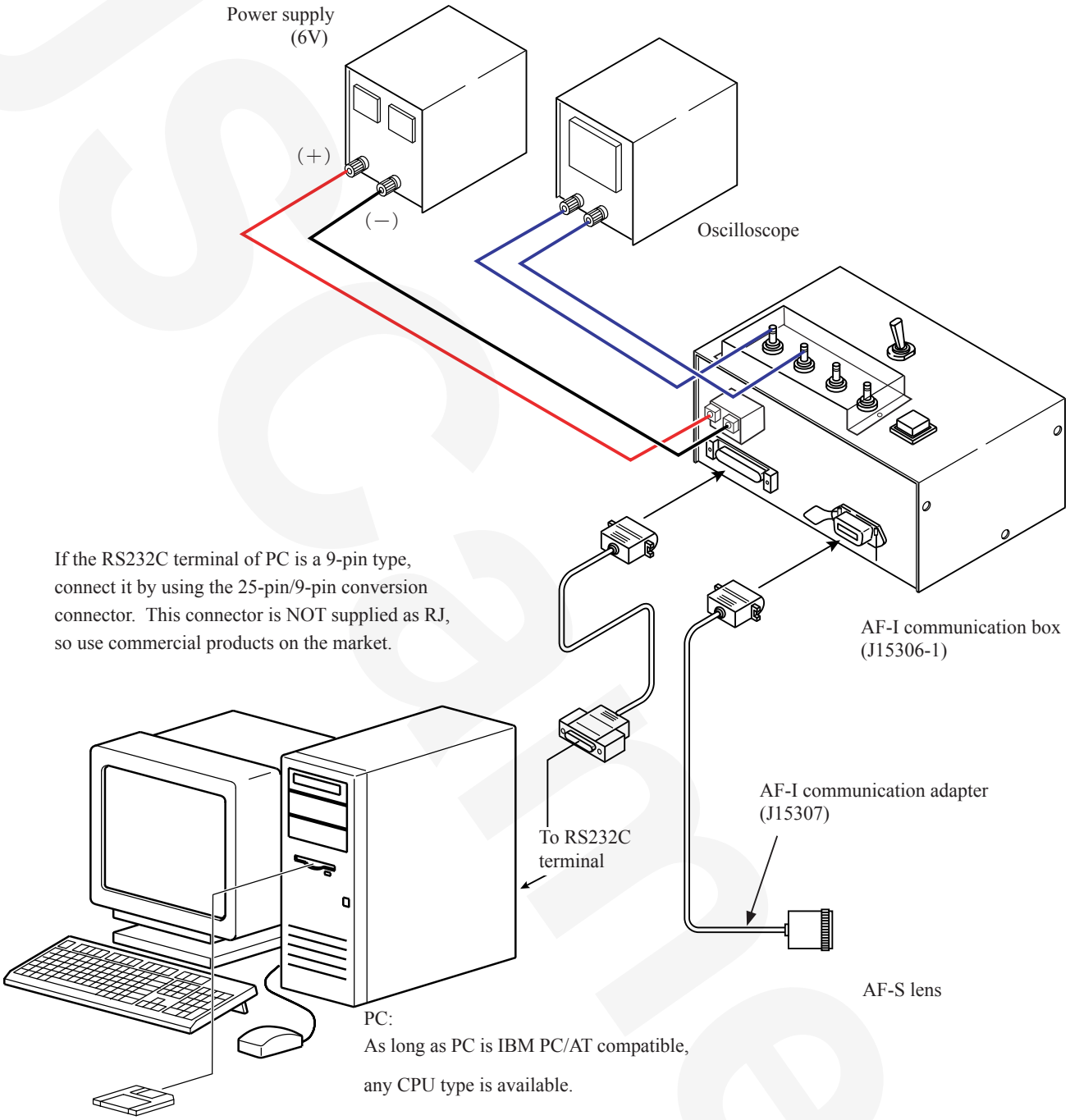
The below hardware requirements are necessary for installing the program on a computer.
Ensure them before installation.

PC	IBM PC/AT compatible
OS	Windows XP Home Edition, Windows XP Professional, Windows 2000, Windows Millennium Edition (Me), Windows 98 Second Edition (SE), Windows 98,
CPU	Pentium Ⅱ 266MHz ～ Pentium Ⅳ 2GHz
RAM (Memory)	32MB or more
HD	6 MB-or-more free space is necessary when installation
Monitor resolution	800×600 or more pixels
Interface	Serial interface ※ USB interface cannot be used.

As long as the above requirements are met, either desktop or notebook PC is available.

【System configuration】

★ : NEWTOOL



AF-S VR 400

★ Inspection and adjustment software (J18428)

Adjustment for Electrical Device

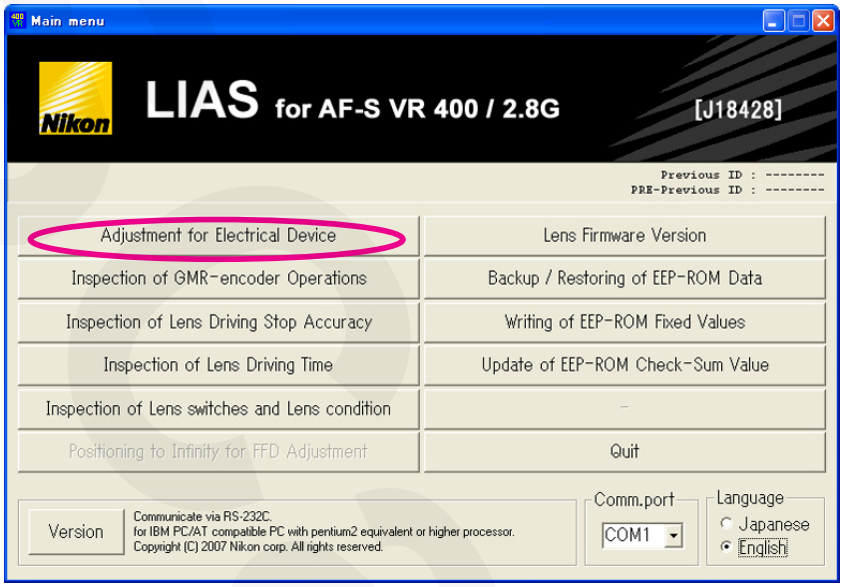
GMR duty adjustment

●In case of replacing the main PCB, SWM unit, GMR unit or Fixed tube unit, be sure to make the adjustments.

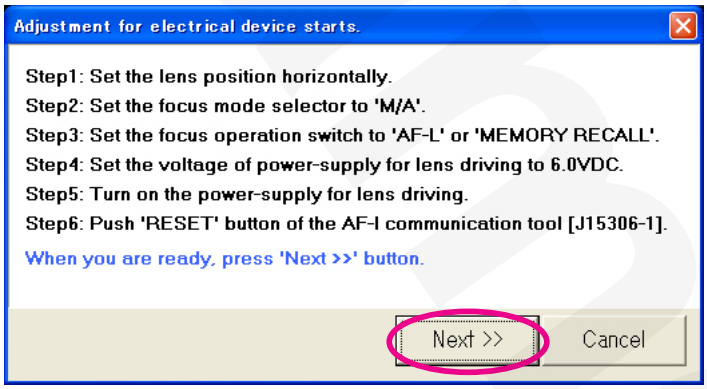
How to adjust:

・Select "Adjustment for Electrical Device" on the main menu.

△ (Revision)



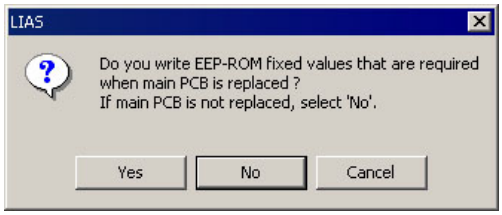
・Follow the instructions on the screen for preparation. Then click "Next".



・To confirm the writing of EEP-ROM fixed values, the screen will appear. Click the appropriate item.

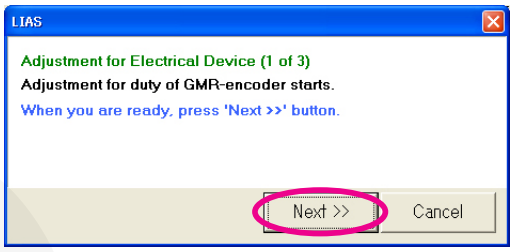
・Clicking "No" goes on to "Duty adjustment" of GMR encoder.

・Clicking "Yes" goes on to "Writing EEP-ROM fixed values" on Page A57.

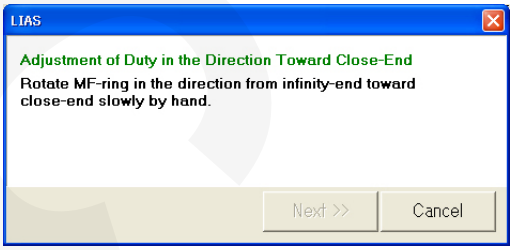


サービス計画課 M

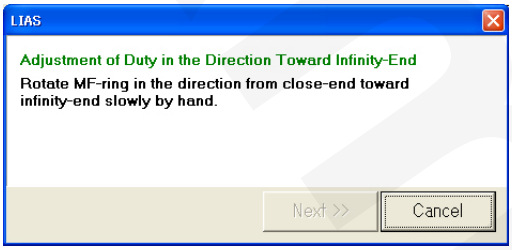
・Follow the instructions on the screen for preparation. Then click "Next".



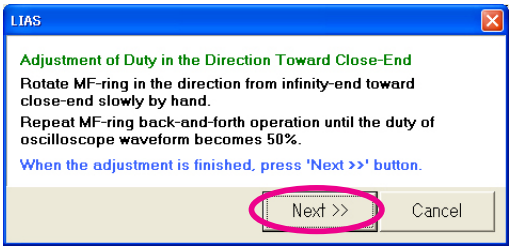
・Rotate the MF ring slowly by hand up to "Close"-end.



・When the screen has changed to the following, rotate the MF ring slowly by hand up to "Infinity"-end.

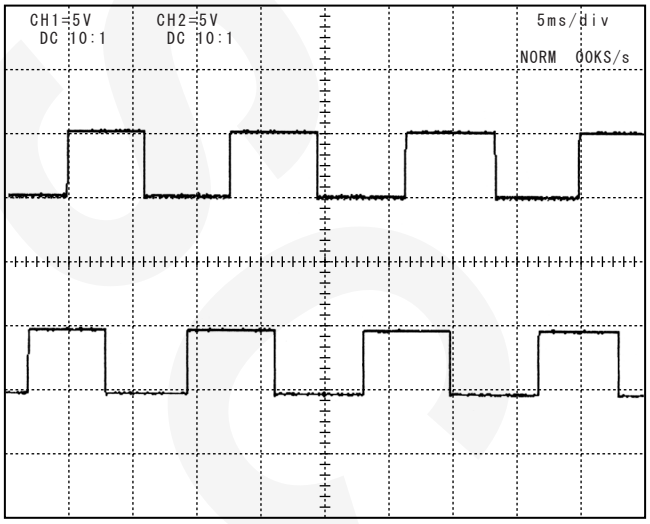


・When the duty adjustment is completed, click "Next" to go on to the SWM offset adjustment.



Caution:
If the duty is not 50% concerning each waveform from "Infinity" to "Close" and "Close" to "Infinity", make the readjustment of "Inspection of GMR encoder output waveform" on Page 5.

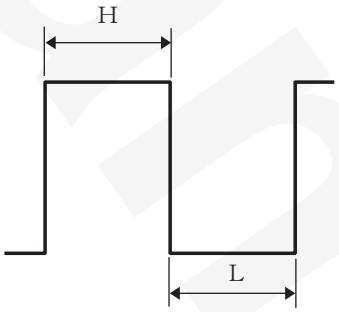
※ Refer to the below for "Oscilloscope settings" and "Standard" of waveform.



●Oscilloscope setting

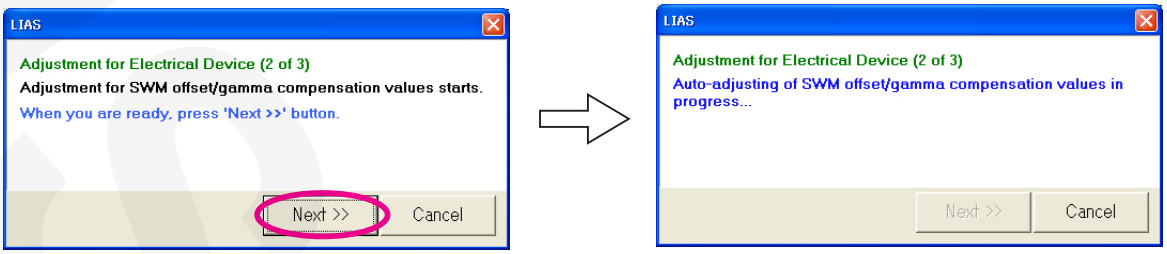
V/Div (CH1)	:5V
V/Div (CH2)	: 5V
Coupling	: DC
Time/Div	: 5m Sec
Trigger Mode	:NORMAL
Trigger Coupling	: DC
Trigger Source	: CH1
Trigger Position	:+ 4div
Trigger Type	: EDGE
Trigger Level	: 2.5V

Standard H:L = 100 : 150 ~ 150 : 100 (50% ±10.0%)



SWM offset adjustment

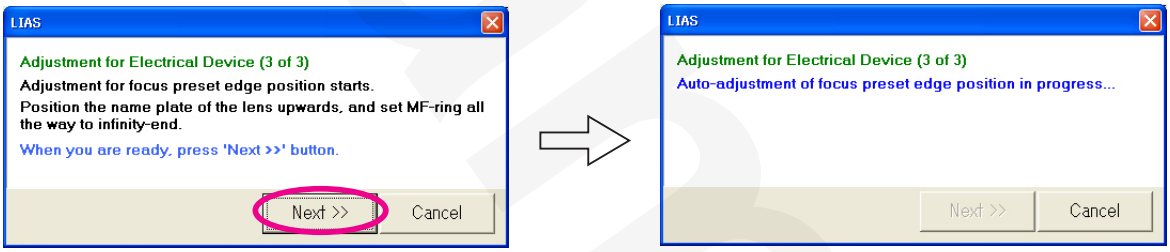
・Click "Next". Automatic adjustment starts.



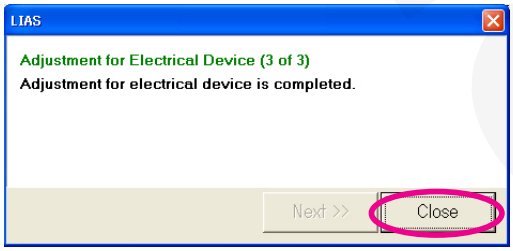
・When the adjustment ends, the procedure goes on to "Focus preset adjustment".

Focus preset adjusment

・Follow the instructions on the screen for preparation. Then click "Next" to start automatic adjustment.



・When the adjustment is completed, click "Close" to end the procedure.



Inspection of GMR encoder operations

・Select "Inspection of GMR-encoder Operations" on the main menu.

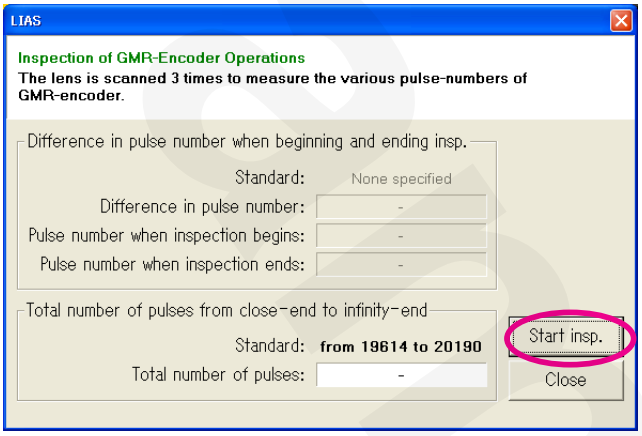
・Follow the instructions on the screen for preparation. Then click "Next".

△ (Revision)

・Click "Start Inspection".

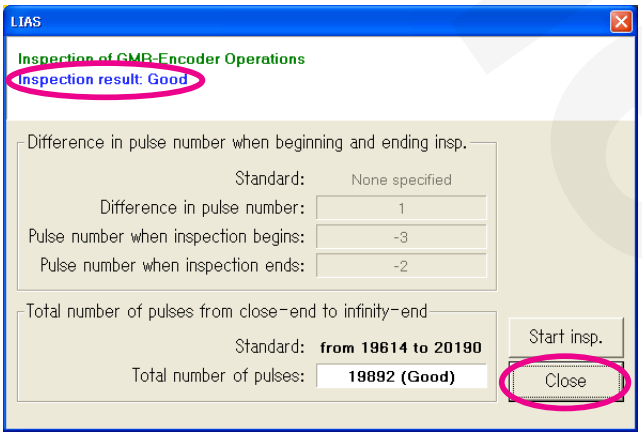
Caution : If the MF ring is rotated while the lens scanning is driven, the pulse shows an abnormal value. Do NOT touch the MF ring during operations.

△ (Revision)



・When the result is within the standard, click "Close" to end the procedure.

△ (Revision)



△ (Revision)

< Standard > Total pulses: ~~19802 ~ 20002~~ 19614 ~ 20190 PULSE (s)

(∞ "Infinity"-end - "Close"- end)

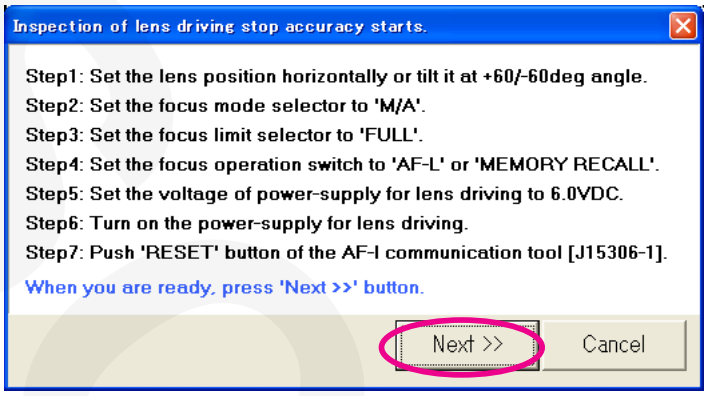
サービス計画課 M

Inspection of Lens driving stop accuracy

・Select "Inspection of Lens Driving Stop Accuracy" on the main menu.

・Follow the instructions on the screen for preparation. Then click "Next".

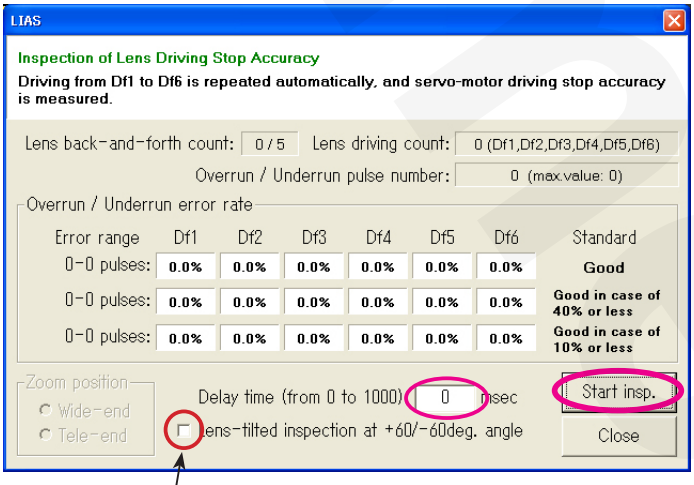
△ (Revision)



・Click "Start Inspection".

・If the lens stops in "Inspection of Lens Driving Stop Accuracy", input a numeric number into "Delay time (from 0 to 1000 msec.) so that the lens does NOT stop.

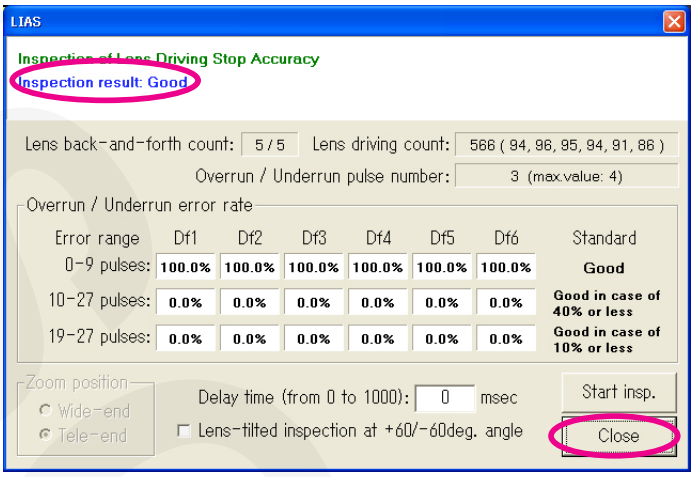
Caution: The value of "ADUST DELAY-TIME" is set by the adjustment software. So, as far as the lens does not stop during the inspection of "LENS DRIVING STOP ACCURACY", any value can be input without problem.
However, the larger the value of "ADJUST DELAY-TIME" gets, the longer the inspection time becomes.



Tick here when the inspection is made with the front lens group being tilt at 60° angle upwards and downwards.

サービス計画課 M

・When the inspection ends, the result will be indicated. If "Inspection result" shows "Good", click "Close" button.



The number of overrun/underrun pulses must be within the standards, after travelling back-and forth 5 times by the lens driving motion.

Lens position/tilt	Error range from Df1 to Df6 (Number of occurrences)	Error pulse incidence rate
Horizontal	0 ～ 9	GOOD
Horizontal	10 ～ 27	GOOD if 40% or less
Horizontal	19 ～ 27	GOOD if 10% or less
Horizontal	28 or more	Only one occurrence is judged as defective.
±60°	0 ～ 9	GOOD
±60°	10 ～ 27	GOOD if 40% or less
±60°	19 ～ 27	GOOD if 10% or less
±60°	28 or more	Only one occurrence is judged as defective.

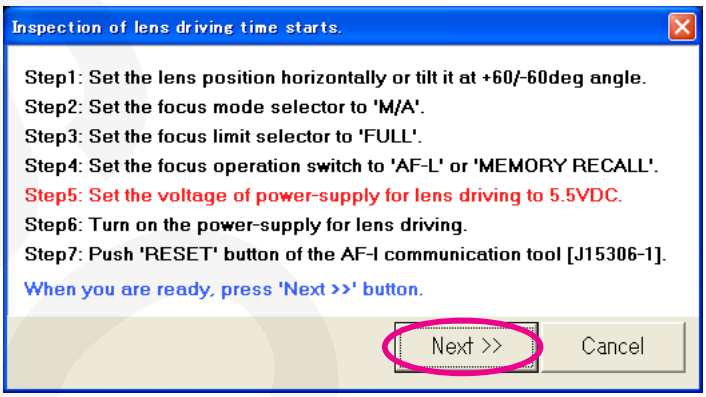
※"Df1~Df6" shows the lens driving amount.

Inspection of Lens driving time

・Select "Inspection of Lens Driving Time" on the menu.

・Follow the instructions on the screen for preparation. Then click "Next".

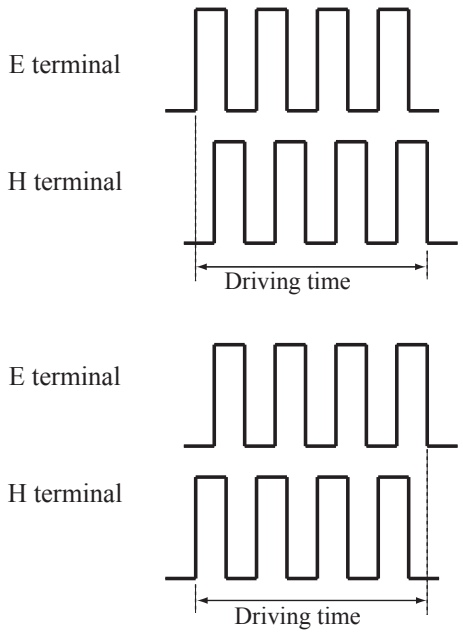
△ (Revision)



(Lens position in inspecting)

"Lens" position	"Name plate" position
Horizontal	Name plate upwards/rightwards/leftwards
Front lens group 60° angle upward	
Front lens group 60° angle downward	

※ There are two types in shape of waveforms of E and H terminals:
Waveform (1) starts and goes up (2) starts and goes down.



●Oscilloscope setting

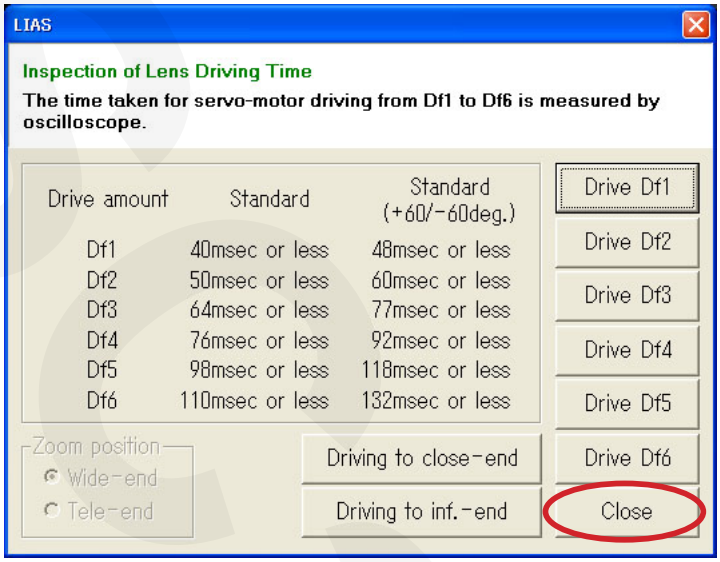
V/Div	: 5V
Coupling	: DC
Time/Div	: 20m Sec
Trigger Mode	: SGL (S)
Trigger Coupling	: DC
Trigger Source	: CH1

サービス計画課 M

・ Select the driving amount respectively. Each lens driving time must be within the standard.

・ When the result is within the standard, click "Close" to end the procedure.

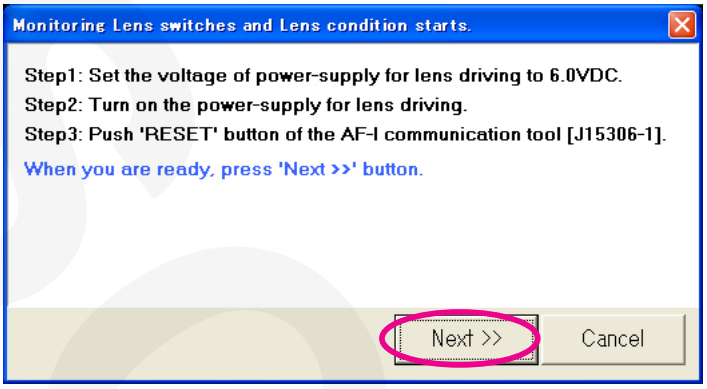
Caution: If the MF ring is rotated during inspections, the waveform shows an abnormal value. Do NOT touch the MF ring during inspections.



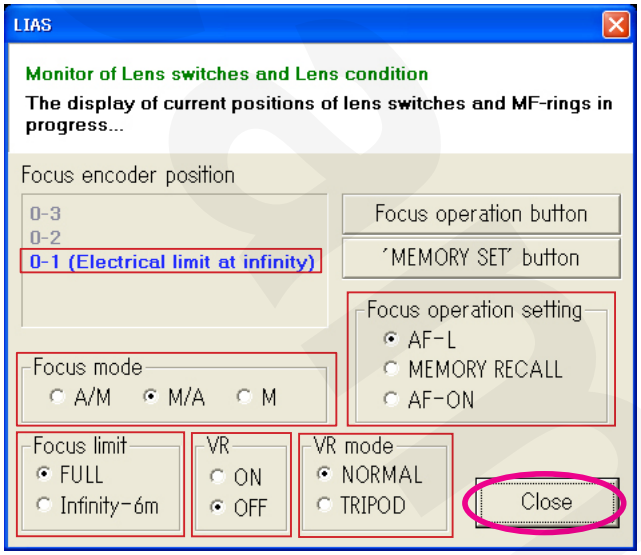
Inspection of Lens switches and Lens condition

・Click "Inspection of Lens switches and Lens condition" on the menu.

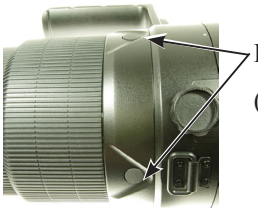
・Follow the instructions on the screen for preparation. Then click "Next".



・If there is no problem with each item, click "Close" to end the procedure.



・Pressing "Focus operation button" of the lens changes the screen to the following.

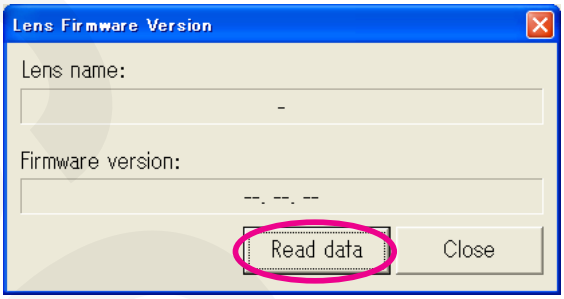


・Pressing "MEMORY SET button" of the lens changes the screen to the following.

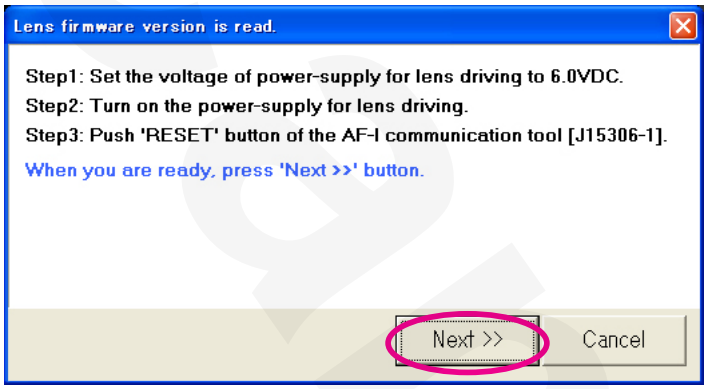
Lens firmware version

・Click "Lens Firmware Version" on the menu.

・Click "Read Data".

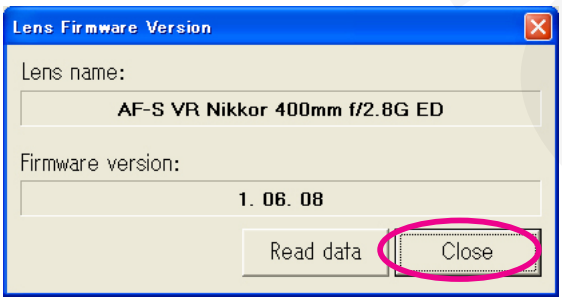


・Follow the instructions on the screen for preparation. Then click "Next".



・Confirm that there is no error in the lens name and the firmware version.

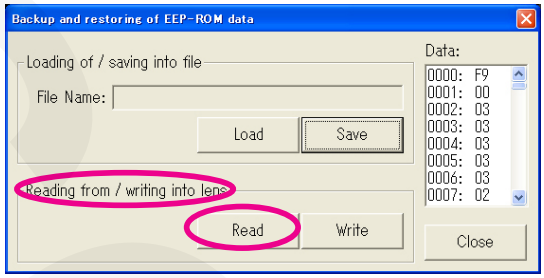
・Click "Close" to end the procedure.



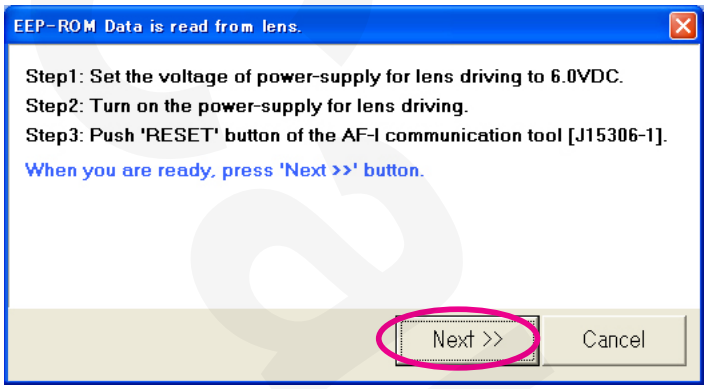
Backup of EEP-ROM data

・Click "Backup/Restoring of EEP-ROM Data" on the menu.

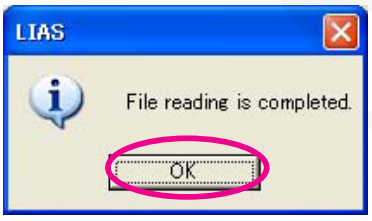
・Click "Read" of "Reading from/writing into lens".



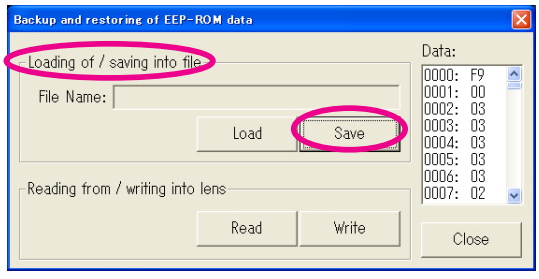
・Follow the instructions on the screen for preparation. Then click "Next".



・When the EEP-ROM data reading is completed, click "OK".

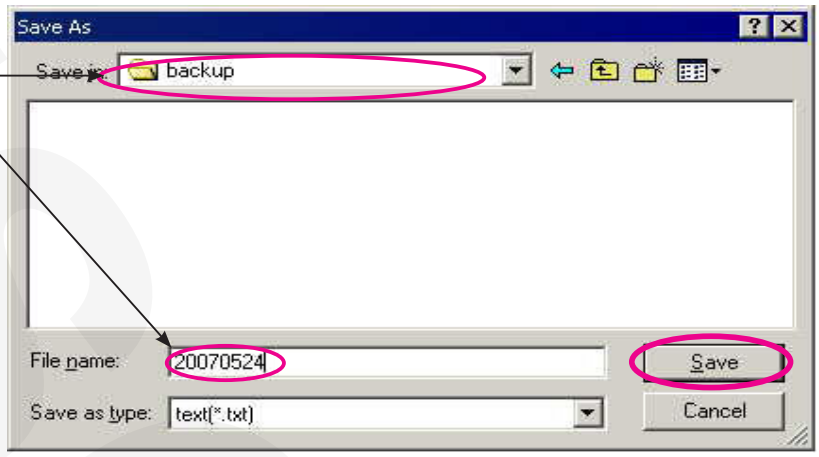


・Click "Save" of "Loading of/saving into file".

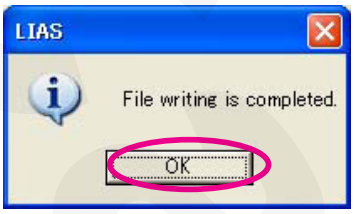


・Type the file name in any folder, and click "Save".

e.g.



・Click "OK".

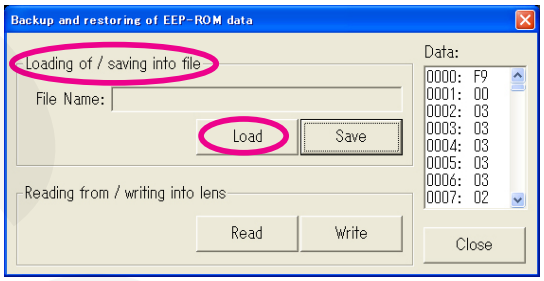


・Click "Close" to end the procedure.

Restoring of EEP-ROM data

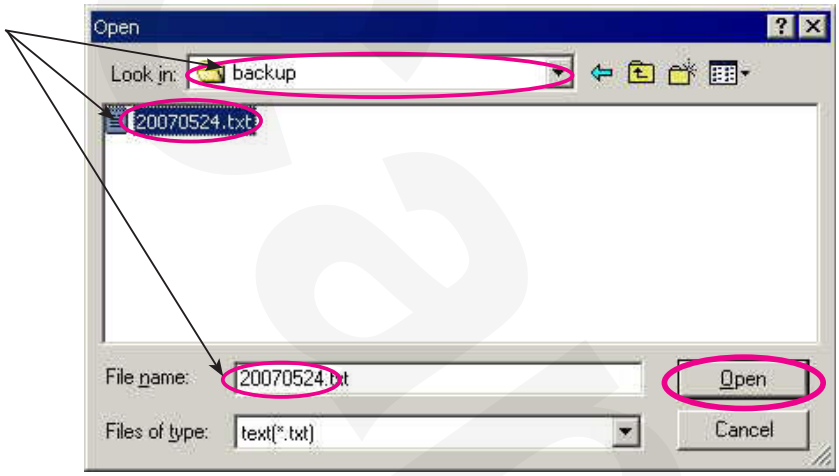
・Click "Backup/Restoring of EEP-ROM Data" on the menu.

・Click "Load" of "Loading of/saving into file".



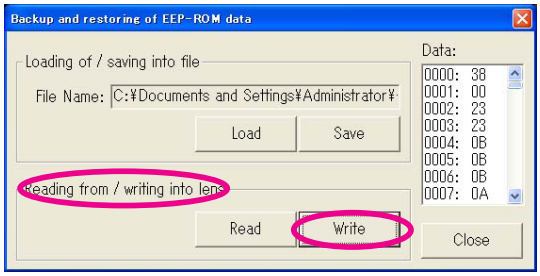
・Select the file name in the folder that was saved as backup, and click "Open".

e.g.

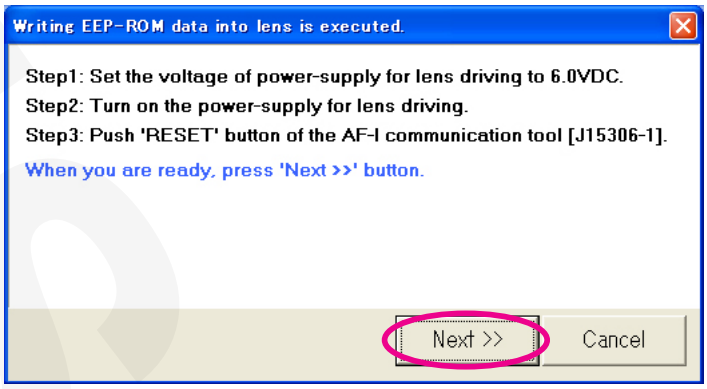


・When the EEP-ROM data reading is completed, click "OK".

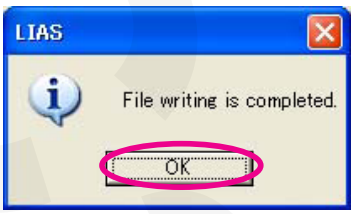
・Click "Write" of "Reading from/writing into lens".



・Follow the instructions on the screen for preparation. Then click "Next".



・When the EEP-ROM data writing is completed, click "OK".

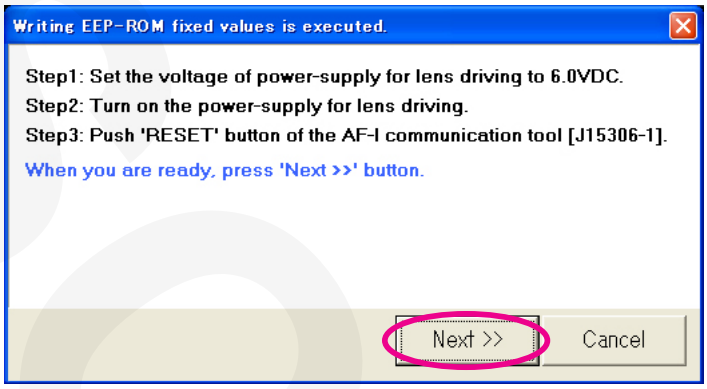


・Click "Close" to end the procedure.

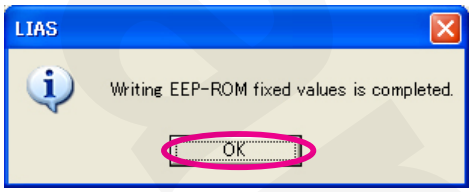
Writing of EEP-ROM fixed values

・Select "Writing of EEP-ROM Fixed Values".

・Follow the instructions on the screen for preparation. Then click "Next".



・When the EEP-ROM data writing is completed, click "OK".



Adjustments required when parts are replaced

Adjustment / Replacement part	MR duty adjustment (requiring writing fixed values) Drive frequency/motor control adjustment	Inspections of MR encoder operations, Lens driving stop accuracy, Lens driving time, of Lens switches and lens condition	VR adjustment
Main PCB unit	○	○	○
SWM unit	○	○	
VR unit-assy		○	○
Gyro-unit		○	○
GMR unit	○	○	
Fixed tube unit	○	○	

VR adjustment

When making the VR adjustment, refer to the "Instruction Manual" that is attached to the VR lens adjustment equipment (J15380).

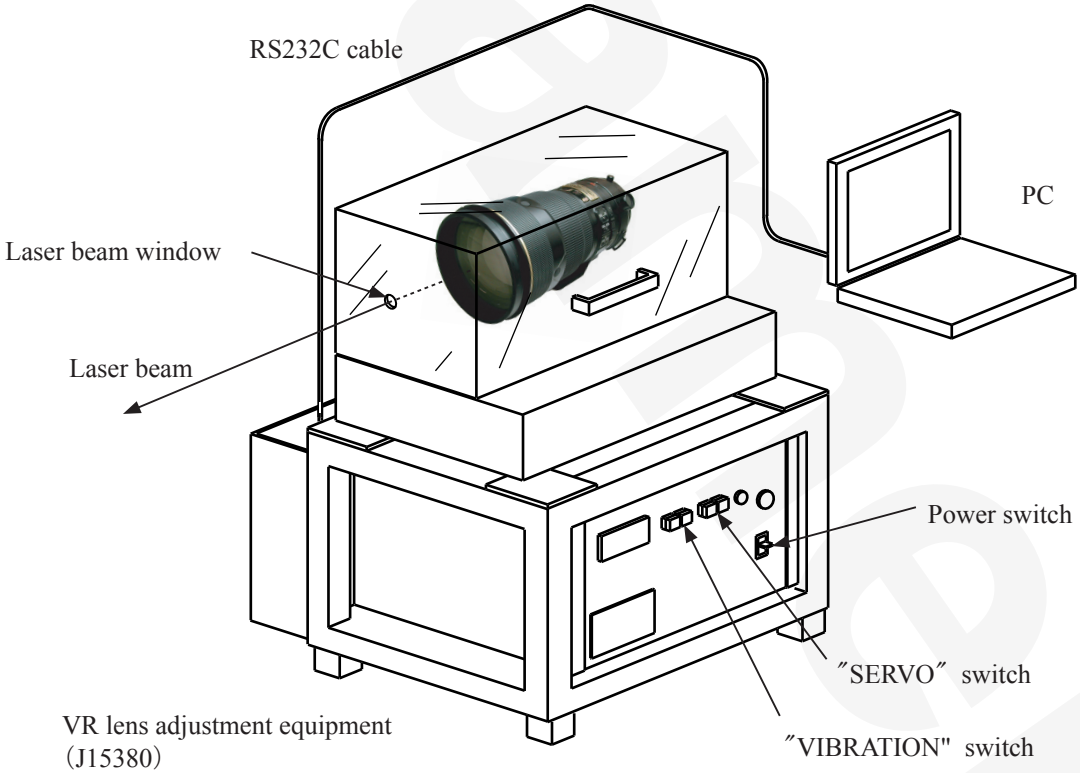
⚠ WARNING	
	●This equipment uses the laser beam. Do not look at the laser beam directly or through the laser beam window.

Preparation

① Set up the VR lens adjustment equipment (J15380) as shown below.

② Connect the PC to the equipment and start the PC.

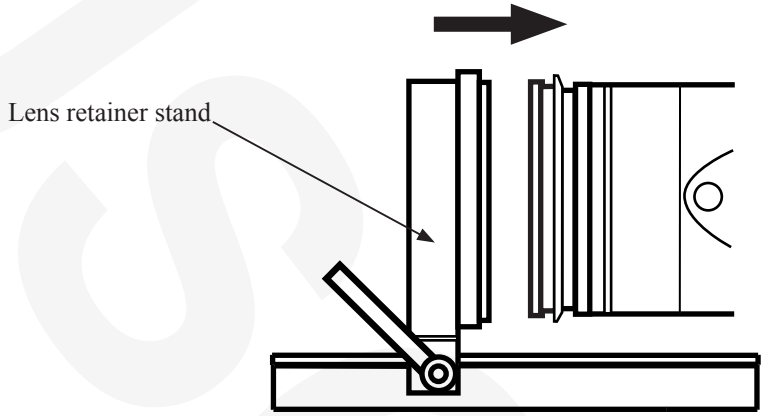
③ Mount the lens on the equipment. Set the focus ring to infinity (∞) position.
Refer to the next page for "Procedure for mounting the lens".



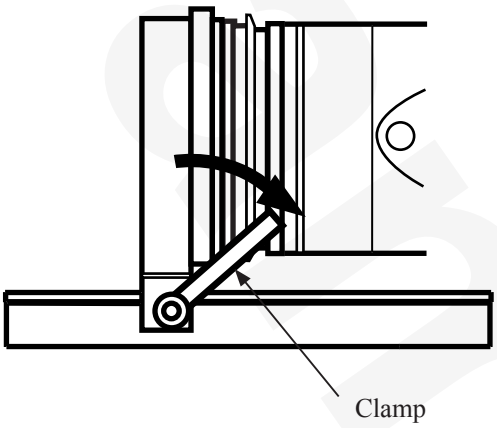
Notes: Keep the approx. 5-m distance from the laser beam window to the radiated surface.
Do not block the light path of the laser beam.

Procedure for mounting the lens

1. Mount the lens on the equipment and move the lens retainer stand in the direction of the arrow.



2. Move the lens retainer stand to the position as shown below and fix it by tightening the clamp.



④ Turn the VR lens adjustment equipment (J15380) ON and start the adjustment software.

⑤ Point the cursor to "AF-S VR 400/2.8G" on the Lens selection screen and click it.

△ (Revision)

※ If the below message appears, reset the focus ring by referring to "Procedure for mounting the lens" on the previous page. Then click "OK" button.
The focus ring is automatically set.

Note: Do not change the lens settings, until the adjustment is completed and go back to the Lens selection screen.

If the setting position changes during the adjustment, the correct adjustment value cannot be obtained.

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Vibration Reduction mode switch inspection

① Point the cursor to the check box next to "VR Mode Switch Inspection" and click it.

② Point the cursor to the "Execute" button and click it.

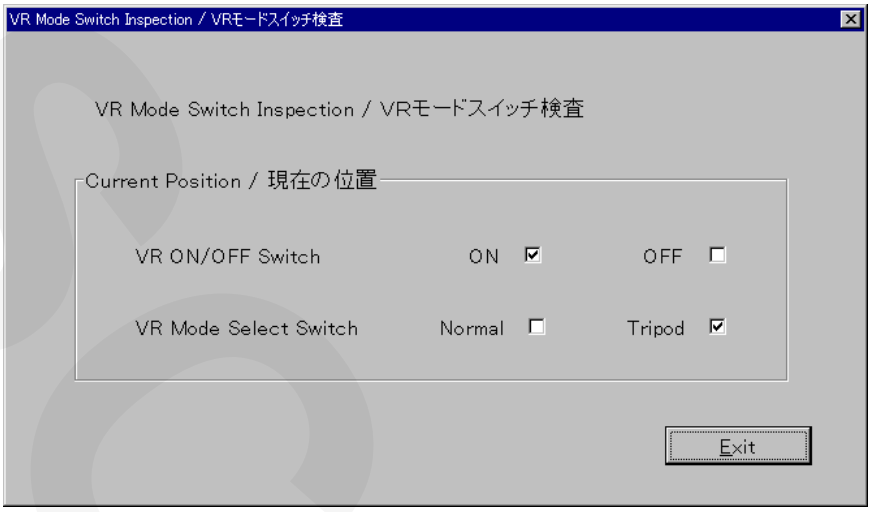
△ (Revision)

③ "VR Mode Switch Inspection" screen appears.

サービス計画課 M

④ The position of VR mode switch is indicated.

Selecting the VR mode switch indicates the current position in the real time.



VR mode switch

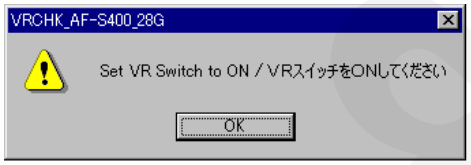
⑤ When completing the VR mode switch inspection, point the cursor to "Exit" button and click it to exit the inspection screen.

VR lens position adjustment

① Point the cursor to the check box next to "VR Lens Position Adjustment" and click it.

② Point the cursor to "Execute" button and click it.

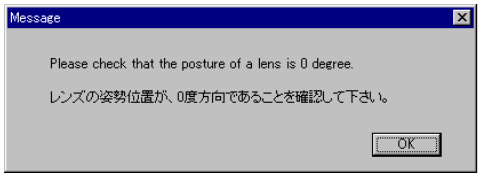
△ (Revision)

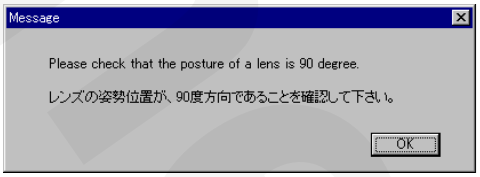


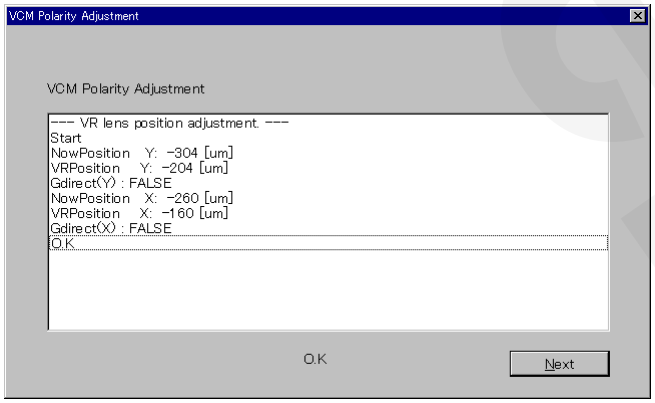
③ The left message appears.
Turn the VR mode switch of the lens to ON, then point the cursor to "OK" button and click it.

・**VCM Polarity Adjustment (Automatic control)**

Detect the polarity of the VCM (Voice Coil Motor) and write it in EEPROM as the compensation value. During the adjustment, the message appears to confirm the lens position of angle (0 or 90 degrees). Therefore, set the lens to the position and click "OK" button.







When "OK" is shown on the execution screen, point the cursor to "Next" button and click it.

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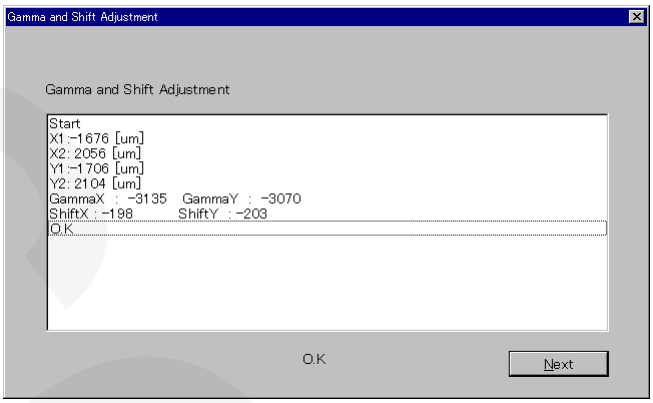
・**Gamma and Shift Adjustment (Automatic control)**

Adjust the tilt and the control center position, based on the position sensor output of the VR unit. During the adjustment, the message appears to confirm the lens position of angle (0 or 90 degrees).

Set the lens to the position and click "OK" button.



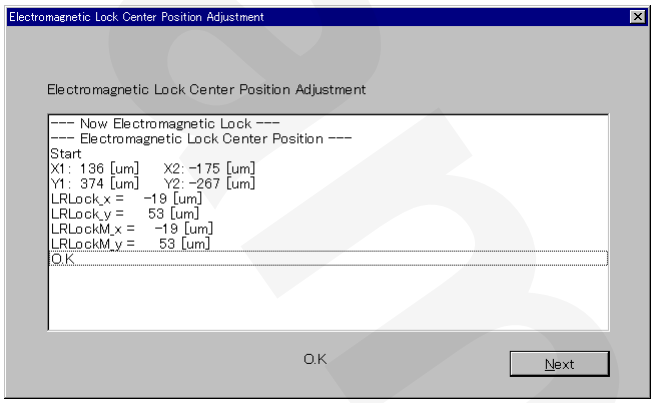
When "OK" is shown on the execution screen, point the cursor to "Next" button and click it.

・**Electromagnetic Lock Center Position Adjustment (Automatic control)**

Adjust the center position at the time of electromagnetic lock.

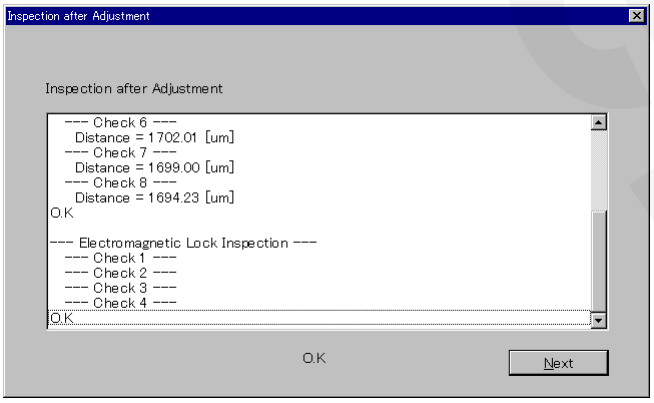
During the adjustment, the message appears to confirm the lens position of angle (0 or 90 degrees).

Set the lens to the position and click "OK" button.



When "OK" is shown on the execution screen, point the cursor to "Next" button and click it.

The inspection mode starts automatically. When the following is displayed on the execution screen, point the cursor to "Next" button and click it.

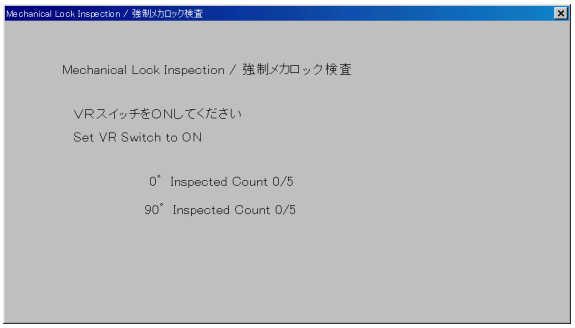


・Mechanical Lock Inspection

While the mechanical lock inspection is made, the inspection result data is written as the adjustment value.

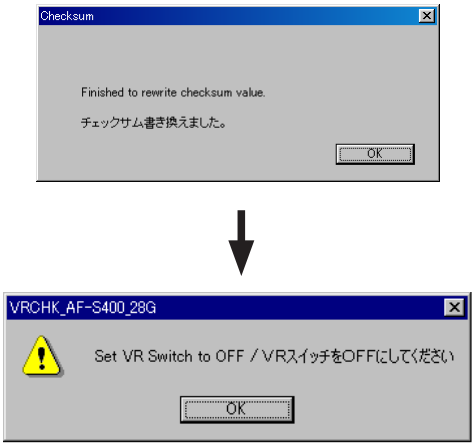
The below 1 and 2 screens are displayed alternately, so turn the VR switch to ON/OFF 5 times each for the lens position at 0 and 90 degrees, according to the indicated instructions.

Screen 1.



Screen 2.

When "OK" is shown on the execution screen, point the cursor to "Next" button and click it.



・When the message "Finished rewriting checksum value" is shown, click "OK" button.
Turn the VR switch to OFF according to the message, and click "OK" button to exit the adjustment screen.

Note:

If "NG" is shown during the adjustment, click "Next" button to exit the inspection mode. Go back to the Lens Selection screen after rewriting the checksum value, and make the adjustment again.

If "NG" appears even after making the adjustment a few times, the VR unit, the gyro PCB, and the main FPC, etc should be defective.

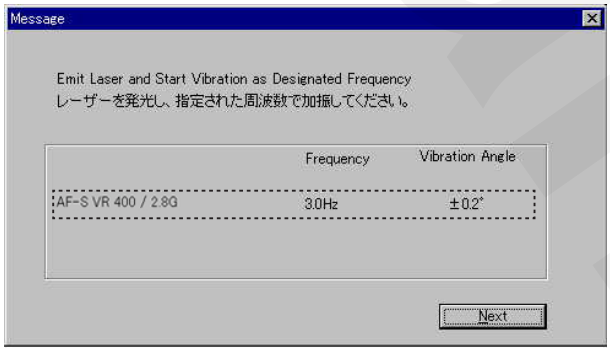
VR Gyro Adjustment

① Point the cursor to the check box next to "VR Gyro Adjustment", and click it.

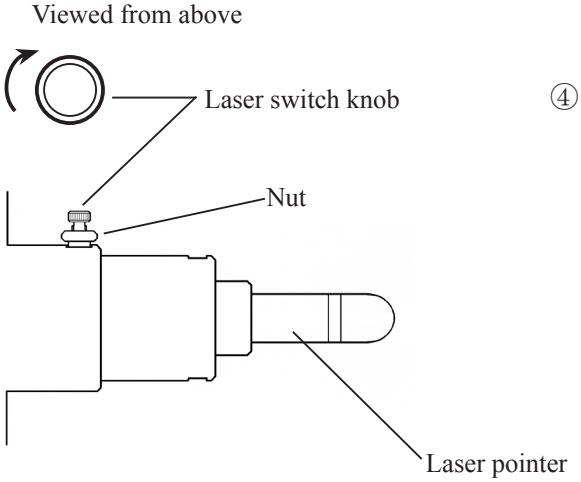
② Point the cursor to "Execute" button, and click it.

△ (Revision)

△ (Revision)



③ The left message appears. △ (Revision)
Set "Frequency" ~~of "Telephoto" to 5.0~~ to 3.0Hz in the settings of the VR lens adjustment equipment (J15380).



④ Loosen the laser switch nut of the VR lens adjustment equipment (J15380), and rotate the knob in the arrow direction to emit laser light.

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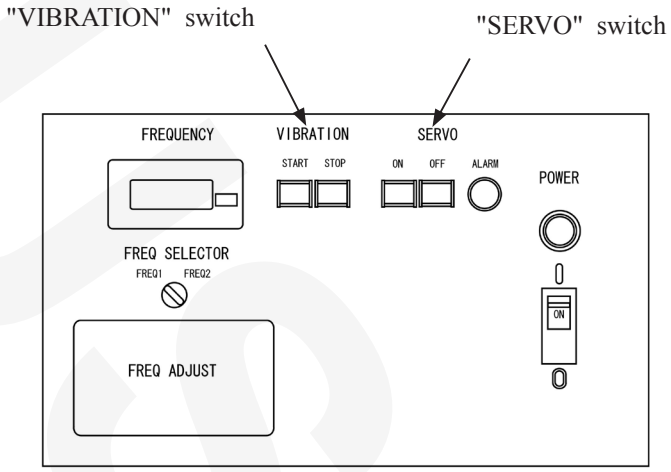
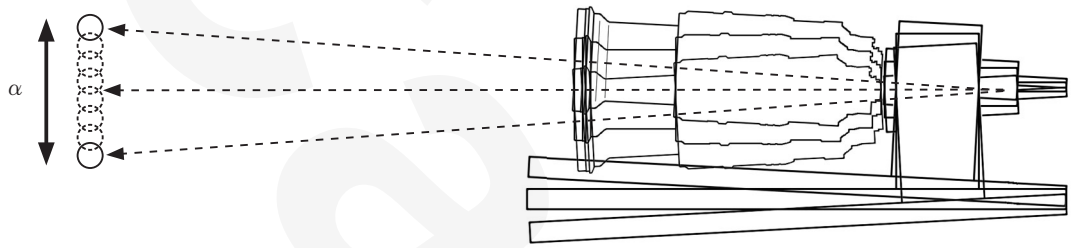
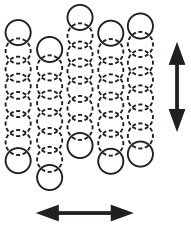


⑤ Press "ON" button for "SERVO" switch and press "START" for "VIBRATION" switch of the VR lens adjustment equipment (J15380).

⑥ When the equipment starts to vibrate, measure the vibration width (α) of the laser beam.





Notes : During the above measurement, laser spot light swings from side to side and up and down. This phenomenon is caused by operations of the VR unit control so NOT defective.

△ (Revision)

⑦ Point the cursor to "Next" button in the message box on the screen and click it. The vibration reduction function starts and the vibration width of the laser beam becomes narrow.

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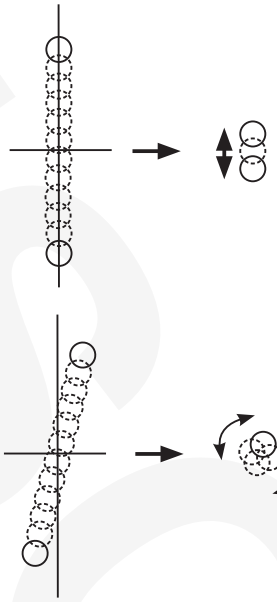
・Adjust misalignment of angle



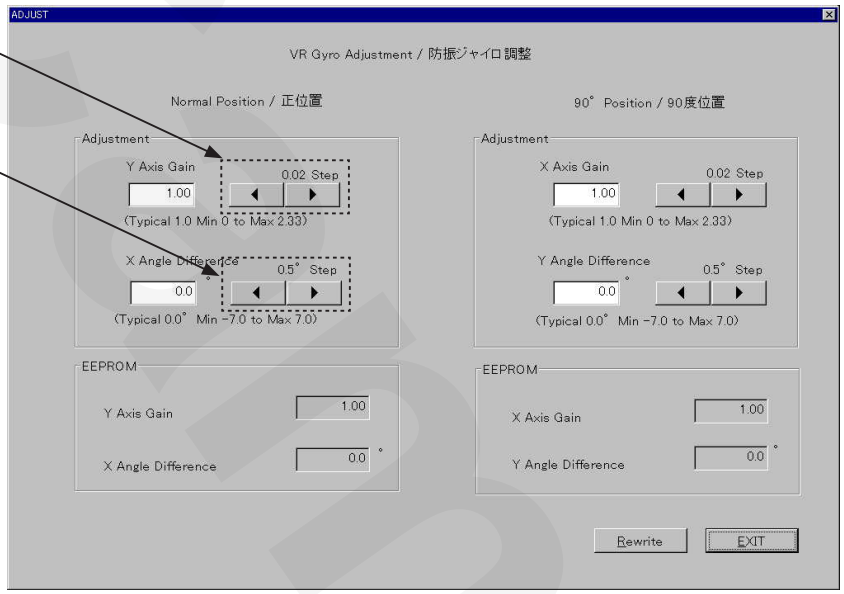
If the angle is misaligned, the laser beam source looks like turning around even after making the Gyro-gain adjustment.
So if such misalignment is detected, adjust and correct it by the adjustment buttons.

Note: After using the adjustment buttons, wait for a few seconds until the vibration movement stabilizes.

△ (Revision)

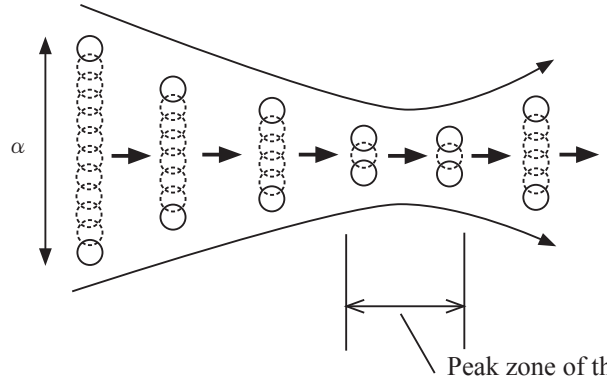
Buttons for adjusting "Gyrog-Gain"

Buttons for adjusting "Angle misalignment"



・Gyro-Gain Adjustment

Adjust the vibration width by the buttons for Gyro-gain adjustment so that the measured vibration width of the laser beam becomes 1/5 or less of the maximum width (α).



Standard:
One-fifth (1/5) or less of the max. vibration width (α)

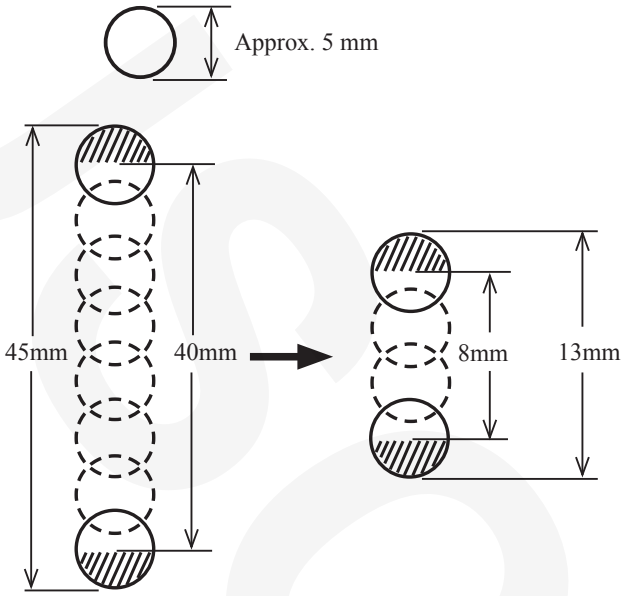
Note: The laser beam vibrates widely again after passing the peak section of the minimum value.

Peak zone of the minimum value of the vibration width

サービス計画課 M

《Ref.》

・The laser spot beam is illuminated with each spot of approx. 5 mm in diameter 5 m away.



① The vibration width must be adjusted at the center of the laser spot. First, measure the whole vibration width.

② Subtract the top and bottom radial parts (shaded areas) of the laser spots from the measured whole vibration width.

e.g.)

When the vibration width as a whole is "approx. 45 mm",
Vibration width of center is:
45 - (2.5 + 2.5) = 40 mm.

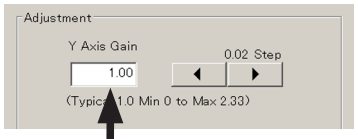
Standard value after the gyro-gain adjustment
40 × 1/5 = 8 mm (Vibration width of center)
Vibration width as a whole is:
8+ (2.5+2.5) = 13 mm.

・How to get the minimum value of the vibration width

① Measure the vibration width while changing the adjustment value that is set every 0.02-Step as shown below.

② The peak zone of the minimum vibration width can be obtained by the actual measured value.

③ The center of the peak zone becomes the adjustment value.



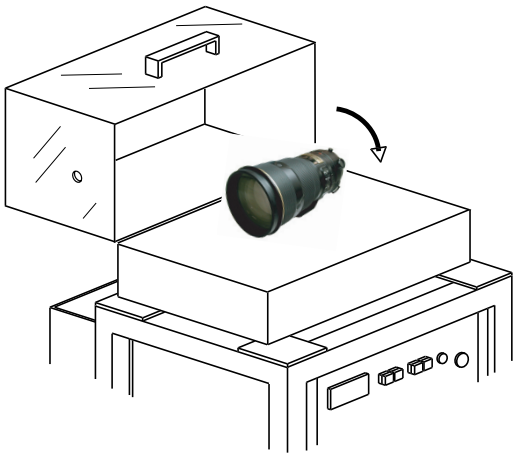
Gyro Gain Adjustment Value	Vibration width Actual measured value
・	・
・	・
0.90	15.5 mm
0.92	14.5 mm
0.94	14.0 mm
0.96	13.5 mm
0.98	13.0 mm
1.00	13.0 mm
1.02	13.0 mm
1.04	13.5 mm
1.06	14.0 mm
1.08	14.5 mm
1.10	15.0 mm
・	・
・	・

Note: Measure the vibration width in increments of 0.5 mm.

・ Press "STOP" button of VIBRATION switch of the VR adjustment equipment to stop vibrations.

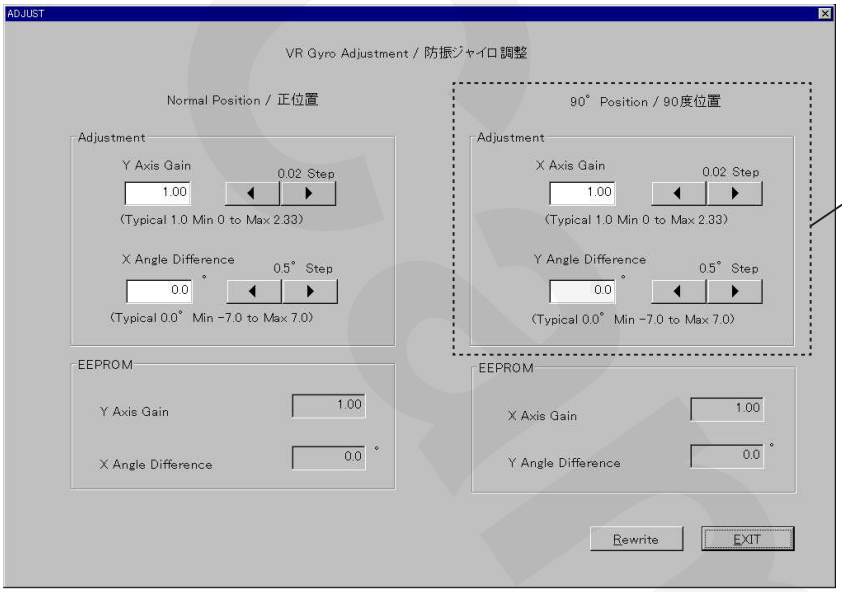
・ Rotate the lens through 90° in the direction indicated by the arrow, then press “START” button of VIBRATION switch to start vibrations.

・ At the 90° position, adjust the angle misalignment and make gyro-gain adjustment.



Note: When adjusting the lens at the 90 ° position, adjust by the buttons for the adjustment at 90 ° position as shown below.

△ (Revision)



Buttons for adjustment at 90 ° position

・After the adjustment, click "Rewrite" button to write the adjustment value in EEPROM in the lens.

・Then, click "EXIT" button to exit the adjustment mode.

Note: If clicking "EXIT" button without clicking "Rewrite" button, the adjustment value is not recorded and the adjustment details are not written.

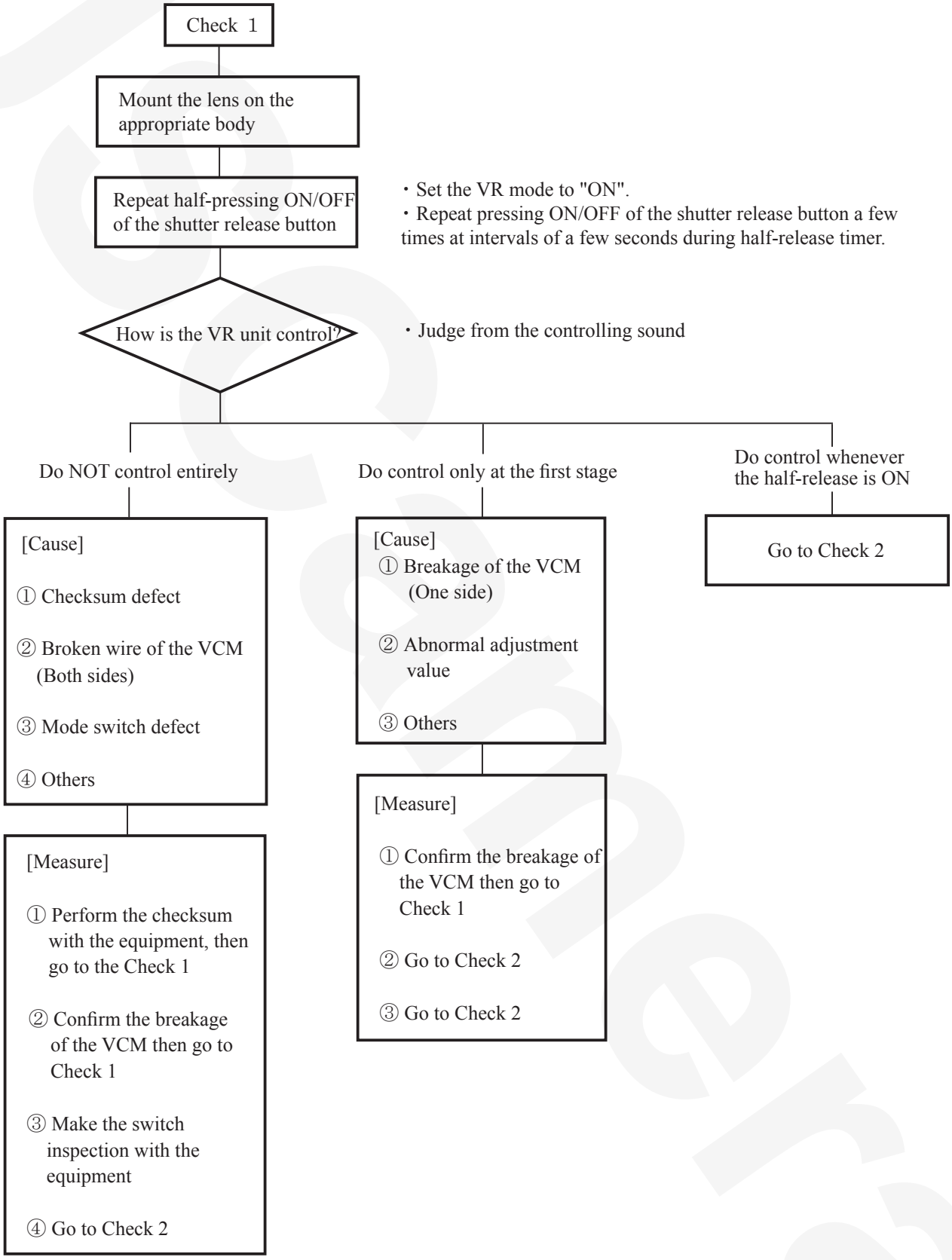
・Click "Quit" button on the adjustment items screen to go back to the Lens selection screen.

Note: Do NOT remove the lens or turn OFF the VR lens adjustment equipment until going back to the Lens selection screen. Otherwise, troubles may occur such as incorrect recording of the adjustment value due to blocked communications, etc..

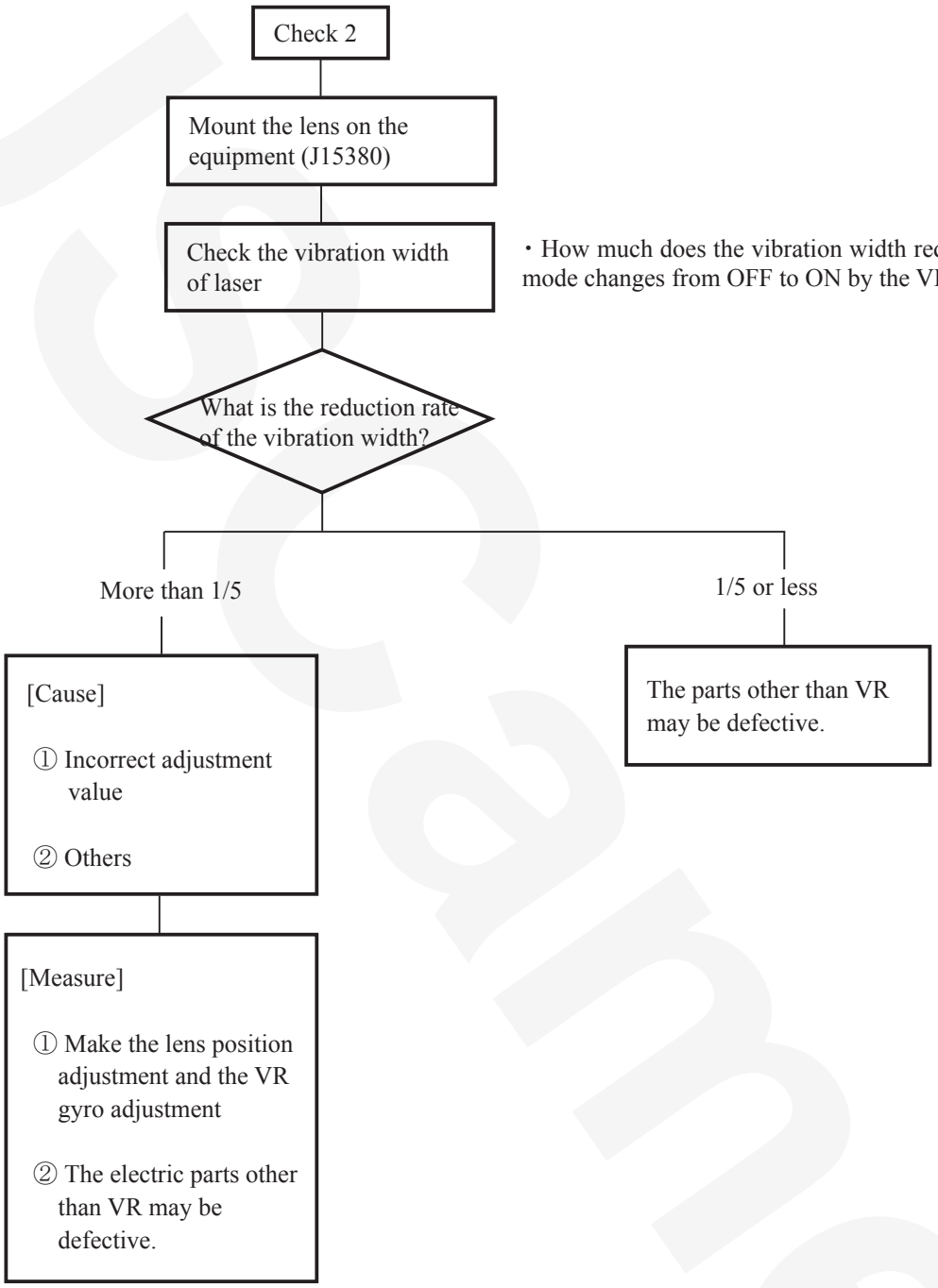
サービス計画課 M

Criteria for VR performance

Before making the VR adjustment of defective products by using the equipment, refer to the following.



Go on to the next page "Check 2"



・How much does the vibration width reduce, when the VR mode changes from OFF to ON by the VR-gyro adjustment.

Aberration compensation data writing adjustment

- This adjustment uses the software which calculates the aberration compensation data according to the feature of lens aberration and writes in EEPROM of the lens, in order to improve the accuracy of autofocus.

Note: This adjustment is necessary when the main PCB and/or each lens part (glass, lens chamber) is replaced or when each lens part is disassembled. Be sure to make this adjustment after completing inspecting and adjusting the main PCB.

(1) Preparation

- Test chart (Self-made tool: ref. Procedure for how to create it.)
- Tripod
- Camera（D100 or D200）
- Personal computer
- USB cable（UC-E4）
- Adjustment software (LWM.exe：used for the lens optical alignment.)

(2) Procedure for how to create Test chart

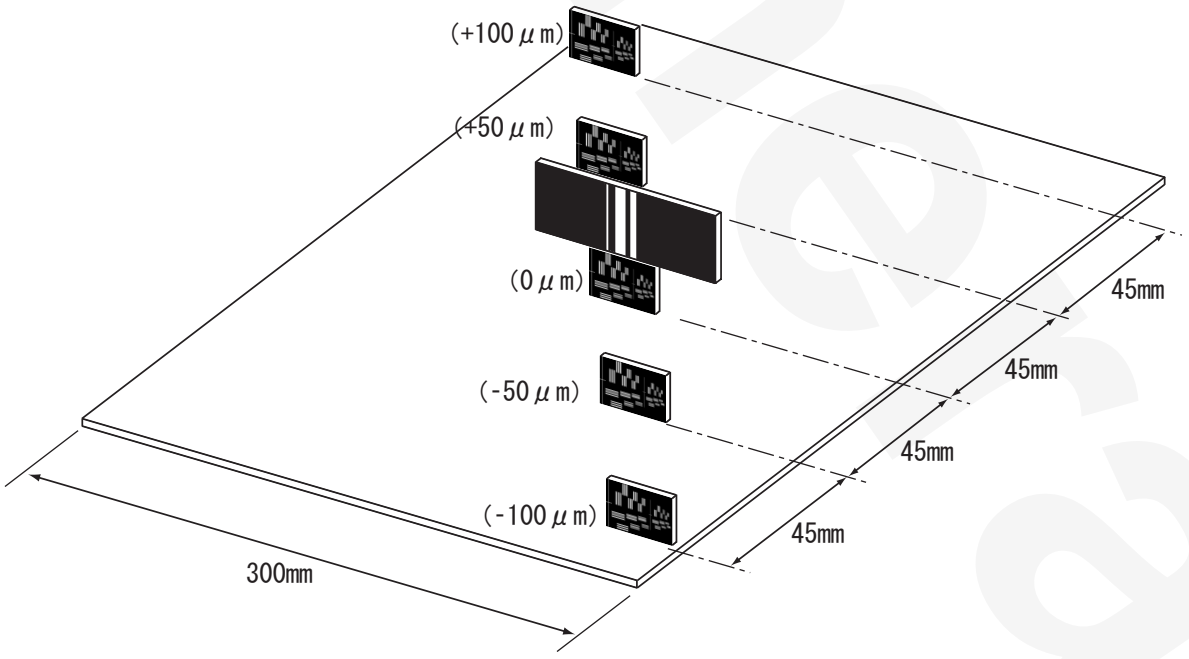
- Photocopy the next page and cut out 1 target chart and 5 resolution charts.

(Target chart)

(Resolution chart)

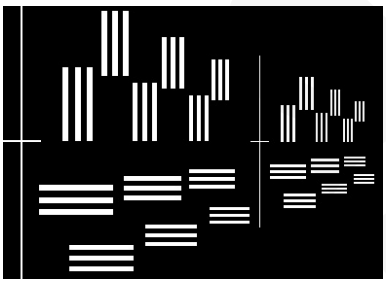
- As shown below, put each chart in position at the specified spacings.

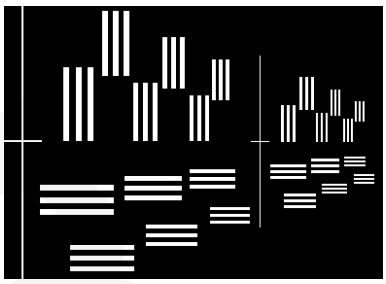
Note: Only in the center, put the target chart on the central resolution chart.

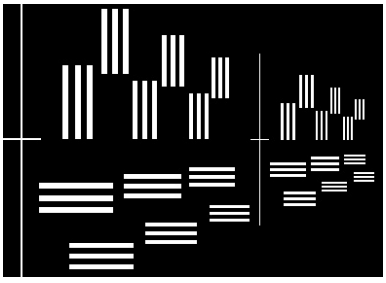


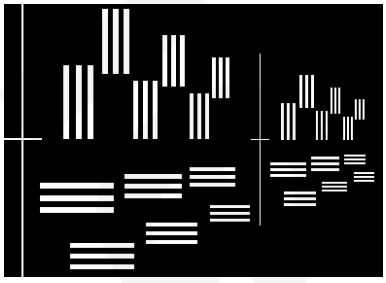
(Target chart)

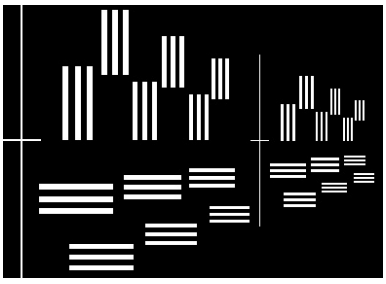
(Resolution chart)







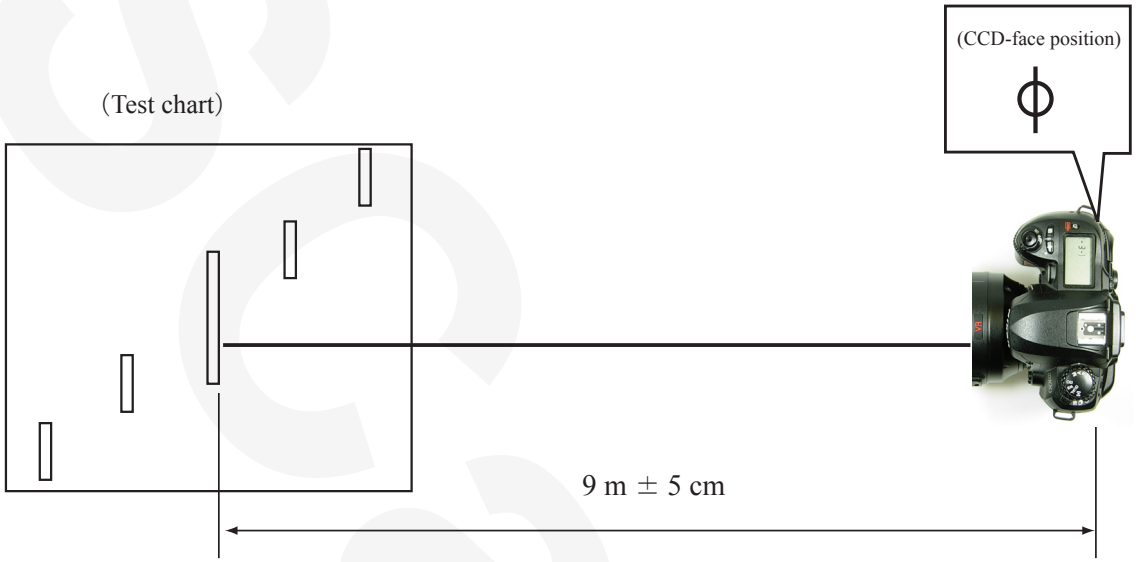




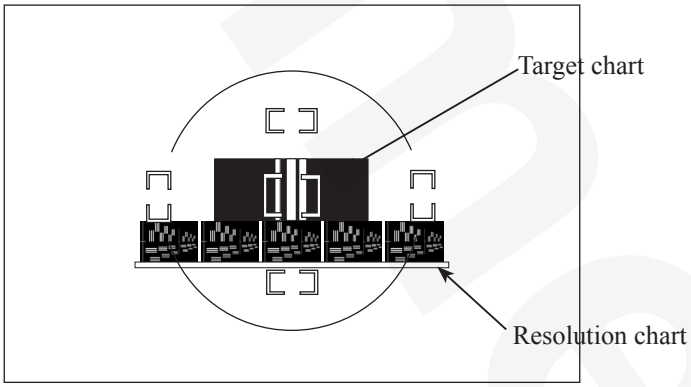
(3) Writing aberration compensation data

① Prepare a camera. Set the "Exposure mode" to "A", the aperture to "Full", and "Focus mode" to "S". On the shooting menu, set the "Image quality mode" to "FINE", "Image size" to"L", **"WB" to "Preset",** and "ISO" to "200".

② Set up the camera, in which the lens to be inspected is fit, on the tripod and the distance between the test chart and camera (CCD face) to 9 m **±5 cm.**



③ As shown below, fit the target chart with the center of the focus area in viewfinder.

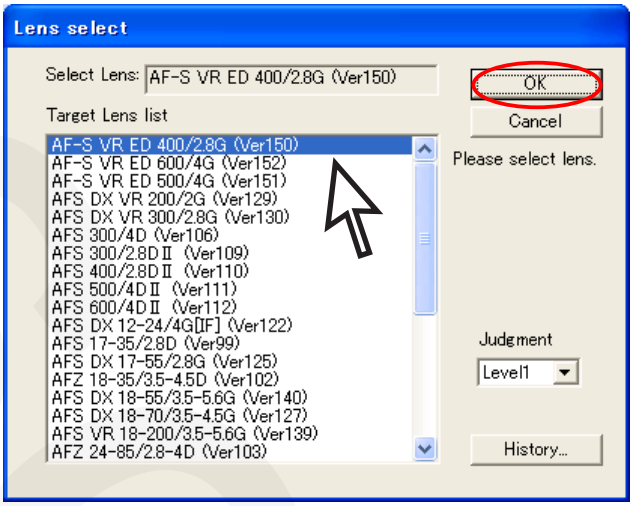


(In viewfinder)

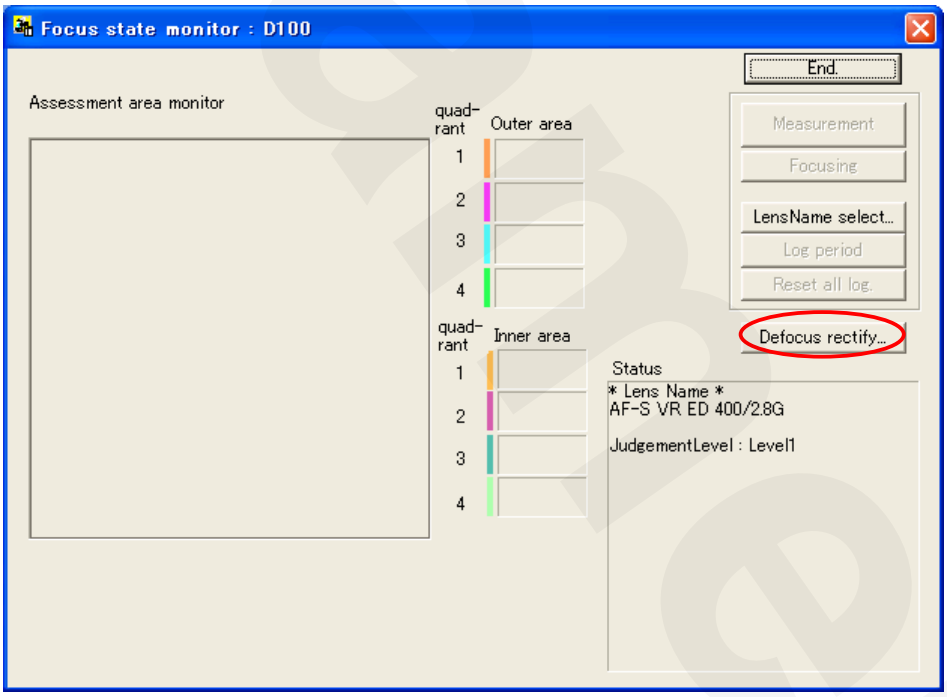
④ Connect the PC and camera via USB cable. (Camera setting: Mass storage)

⑤ Start the adjustment software (LWM.exe).

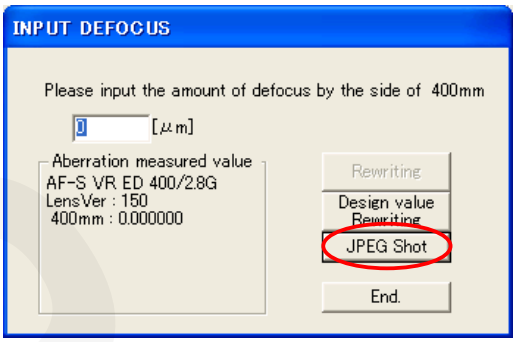
⑥ Confirm that "AF-S VR ED 400/2.8G" is selected on "Lens select" screen. Click "OK".



⑦ Click the "Defocus rectify..." .

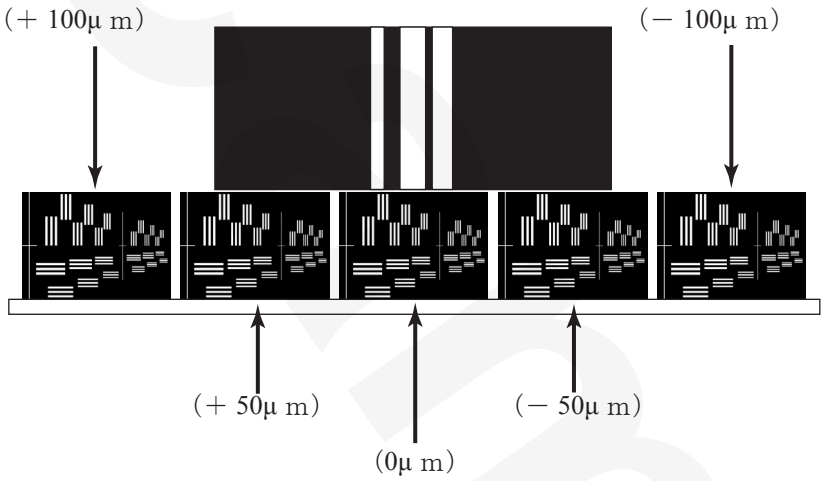


⑧ Click the "JPEG Shot".



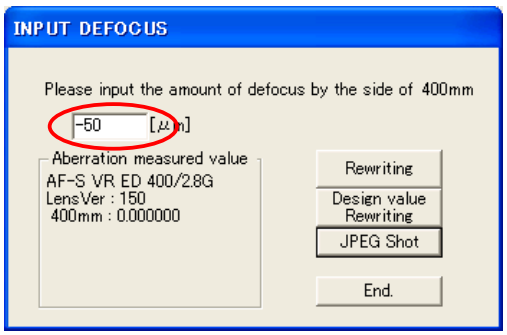
⑨ The shutter is released after the AF operation. The shot image is automatically displayed on the PC screen.

Scale the image to 100% and check which chart is in focus of the 5 resolution charts.

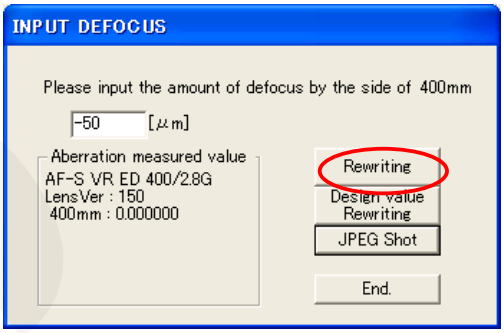


⑩ Input the value of the focused position into the entry field.

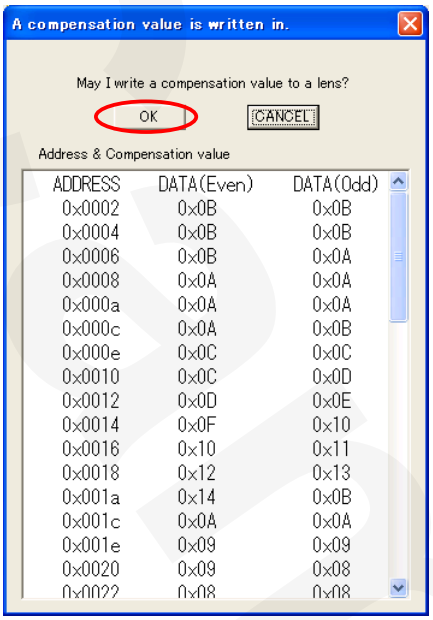
e.g.) Focus position is "-50μm" toward the front-focus side.



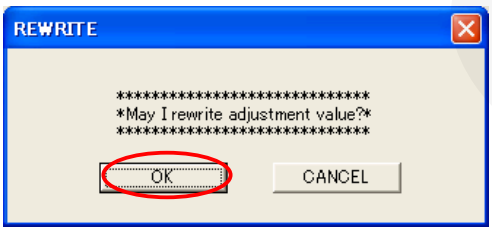
⑪ Click on "Rewriting".



⑫ When the following screen appears, click "OK".

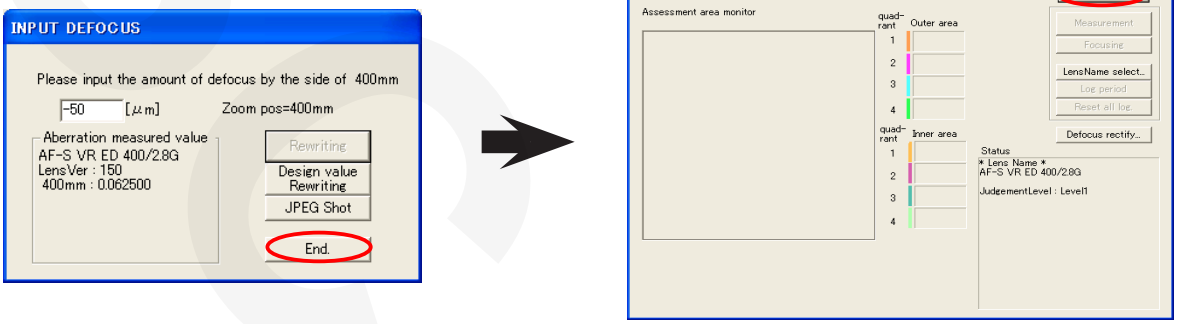


⑬ The reconfirmation screen is displayed. Click "OK".



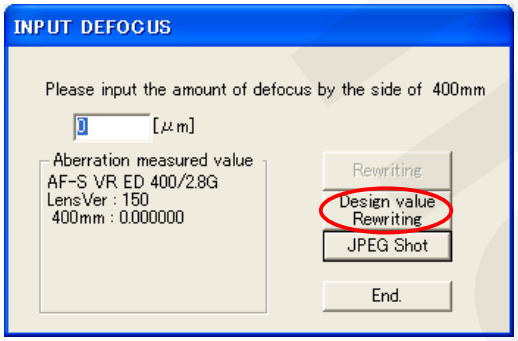
⑭ When the rewriting ends and the following screen appears, click "OK".

⑮ Click "END" twice to complete the adjustment software.



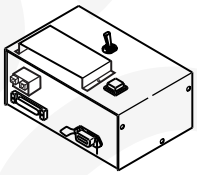
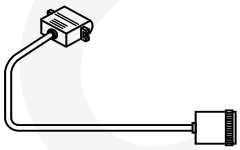
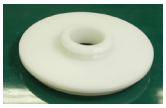
Note: Unless the camera is turned off once, the value that was written in EEPROM is not reflected.

⑯ Check whether an object is in focus by actually taking pictures. If it is out of focus, make the readjustment. If this phenomenon does not improve even after repeating the procedure, some abnormal value may have been written in the EEPROM. In this case, therefore, click "Design value Rewriting" and input the initial value, and then make the adjustment.



工具編 TOOLS

★ : NEW TOOL

	RJ 番号 RJ No.	名称 NAME OF TOOL	備考 OTHERS
	J9001-5N-1 	安定化電源５Ａ DC REGULATED POWER SUPPLY 5A	
★	J18428 	AF-S VR 400/2.8G 調整用ソフト Adj.SOFT for AF-S VR 400/2.8G	
★	J18431 	AF-S VR 400/2.8G VR 調整用ソフト VR-Adj.SOFT for AF-S VR 400/2.8G	
	J15306-1 	ＡＦ－Ｉ通信ボックス AF-I LENS COMMUNICATION BOX(CE)	
	J15307 	ＡＦ－Ｉ通信アダプター COMMUNICATION ADAPTER FOR AF-I	
	J15416 	通信工具 4 PIN COMUNICATION TOOL	AF-S VR 300/2.8G AF-S VR 500/2.8G AF-S VR 600/2.8G △（追加 /Addition）
	工具設定なし RJNo.is not available	パーソナルコンピュータ PERSONAL COMPUTER	
	~~DL-1640~~DL1640 △（訂正 /Revision）	オシロスコープ OSCILLOSCOP　DL-1640	
	J15380	ＶＲレンズ調整装置 INSPECTION TOOL FOR VR LENS	
★	J15380-9 	VR レンズ調整用アダプター VR lens adjustment adapter	140mm 用
★	J11350 	AF-S 400/2.8G 1.5 群回螺器 WRENCH FOR 1.5G AF-S 400/2.8G	
★	J11351 	AF-S 400/2.8G 2 群回螺器 WRENCH FOR 2G AF-S 400/2.8G	
★	G-03031X	ニチモリ GREASE(G03031X)	
	EBB7013	リキモリＧ８６１３ LIQUI-MOLY POWDER GREASE (G8613)	

サービス計画課 M

	RJ 番号 RJ No.	名称 NAME OF TOOL	備考 OTHERS
	J11314 	AF-S VR ~~400~~300/2.8G　３群回螺器 △（訂正 /Revision） WRENCH FOR 3G AF-S VR 300/2.8G	AF-S VR 300/2.8G AF-S VR 500/2.8G AF-S VR 600/2.8G △（追加 /Addition）
	J11313 	~~ＶＲユニット固定工具~~ＶＲ固定工具（３群） △（訂正 /Revision） VR FIX TOOL FOR 3G AF-S VR 300/2.8G	AF-S VR 300/2.8G AF-S VR 500/2.8G AF-S VR 600/2.8G △（追加 /Addition）
★	J11352 	AF-S 400/2.8G 距離目盛ピン FOCUS INDEX PIN FOR AF-S 400/2.8G	AF-S VR 500/2.8G AF-S VR 600/2.8G △（追加 /Addition）
★	J11353 	AF-S 400/2.8G フォーカス固定ピン FOCUS FIXING PIN FOR AF-S 400/2.8G	AF-S VR 500/2.8G AF-S VR 600/2.8G △（追加 /Addition）
★	T91313	ハイオスビット BP-H4-#0（2.0 × 20）B-180 DRIVER BIT 2.0×20(HIOS)B-180	AF-S VR 500/2.8G AF-S VR 600/2.8G △（追加 /Addition）
	OS-30MEL 	ドライサーフ　OS-30MEL DRY SERF OS-30MEL(OIL BARRIER)	
	I-40	ＡＦレンズ用グリース（Ｉ－４０） GREASE FOR AF LENS	
	F-890	ドライルーブ　Ｆ－８９０ DRILUBE F-890	
	G92KA	フロイル　Ｇ９２ＫＡ FLOIL (G92KA)	
	~~G7813~~ EBB8041　△（削除 /deletion） △（訂正 /Revision）	~~スクアグリース~~Ｇ７８１３ GREASE (G7813)	
	C-8008B 	セメダイン　８００８（黒） CEMEDINE 8008(BLACK)	
	EDZ4113	ボンド　Ｇ１０３ BOND G103	
	GE-8	ＡＦレンズ用グリースＧＥ８ GREASE FOR AF LENS GE-8	
	L-241	ロックタイト＃２４１（青） LOCTITE #241	
	EDB0011 	ネジ゛ロック（赤）1401C SCREW LOCK 1401C	
	TA-0002 		ポリフィルムテープ TAPE
	TA-0020 		カプトン テープ２０W TAPE 20W

サービス計画課 M

作成承認印	配布許可印
ニコン映像カンパニー 品質保証部 GM	サービス計画課 M

AF-S Nikkor 400mm f/2.8G VR ED

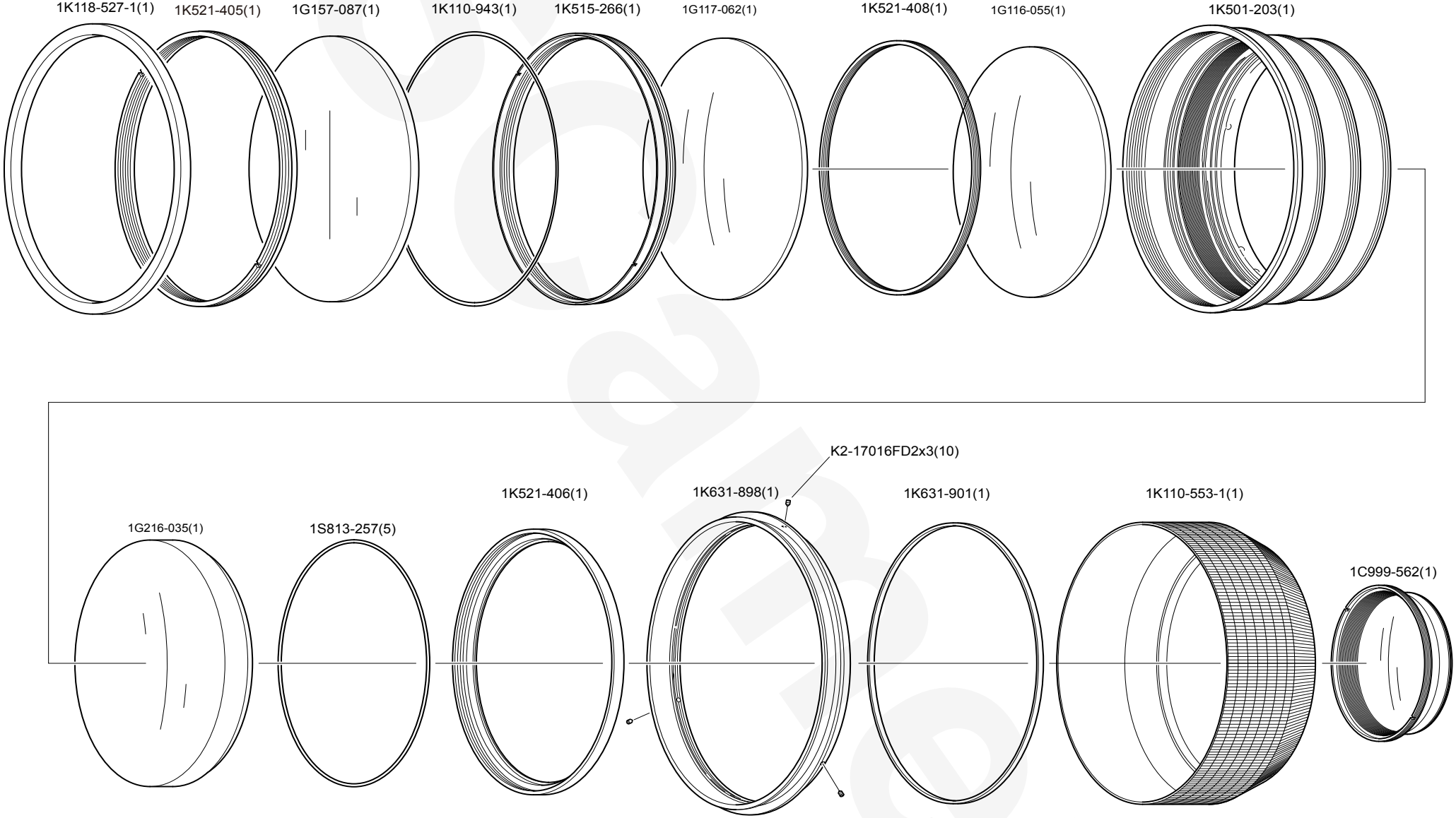
JAA52851

PARTS LIST

修 理 部 品 表

Nikon | NIKON CORPORATION
Tokyo, Japan

Printed in Japan August 2007


A
B
C
D
1
2
3
1K118-527-1(1)
1K521-405(1)
1G157-087(1)
1K110-943(1)
1K515-266(1)
1G117-062(1)
1K521-408(1)
1G116-055(1)
1K501-203(1)
K2-17016FD2x3(10)
1K521-406(1)
1K631-898(1)
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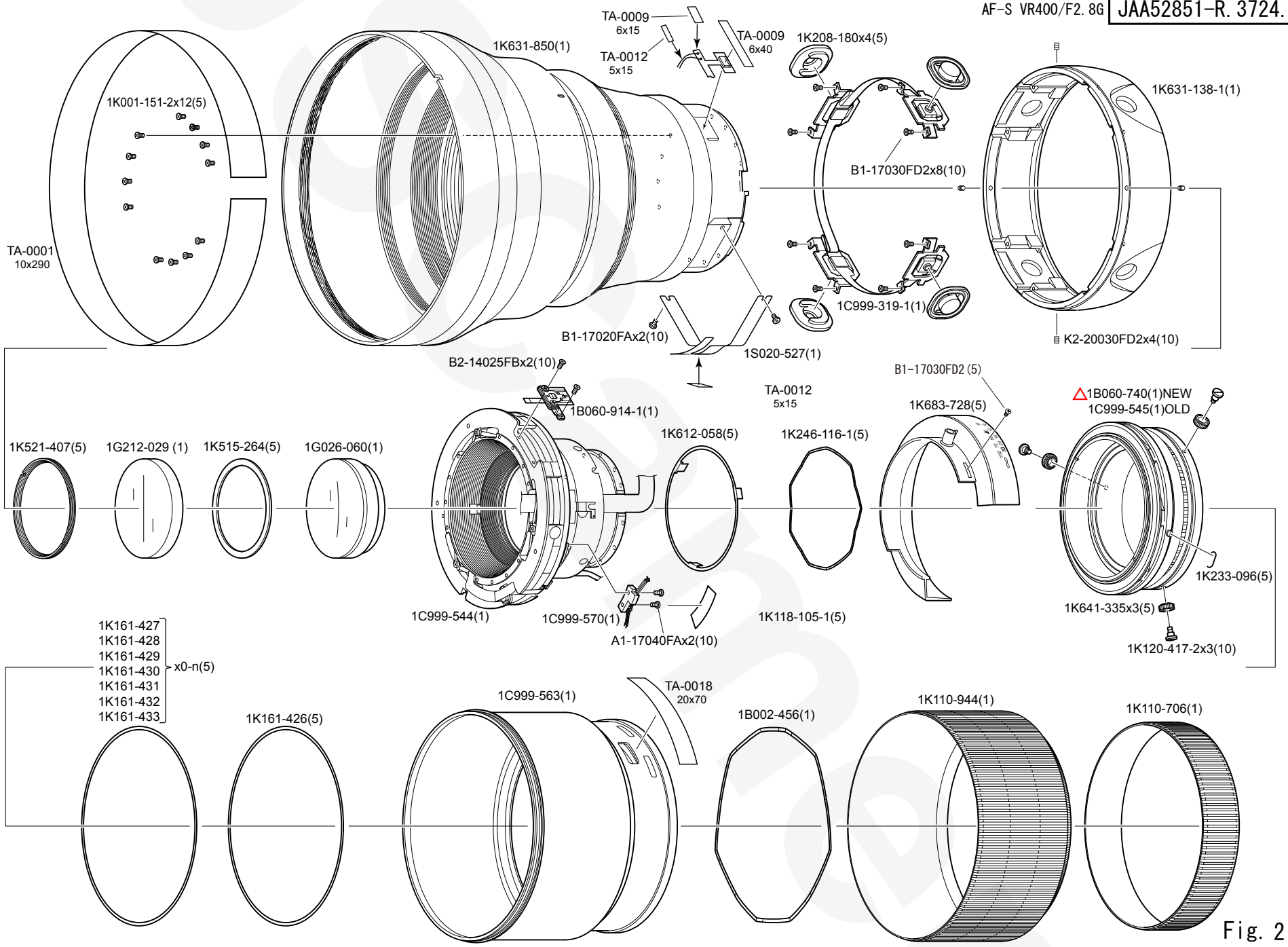
1K110-553-1(1)
1G216-035(1)
1S813-257(5)
1C999-562(1)

Fig. 1


A
B
C
D
1
2
3
TA-0009
6x15
TA-0012
5x15
TA-0009
6x40
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1K208-180x4(5)
1K631-138-1(1)
1K001-151-2x12(5)
B1-17030FD2x8(10)
TA-0001
10x290
1C999-319-1(1)
K2-20030FD2x4(10)
B1-17020FAx2(10)
1S020-527(1)
B2-14025FBx2(10)
1B060-914-1(1)
TA-0012
5x15
B1-17030FD2(5)
1K683-728(5)
△1B060-740(1)NEW
1C999-545(1)OLD
1K521-407(5)
1G212-029(1)
1K515-264(5)
1G026-060(1)
1K612-058(5)
1K246-116-1(5)
1K233-096(5)
1K641-335x3(5)
1K120-417-2x3(10)
1C999-544(1)
1C999-570(1)
A1-17040FAx2(10)
1K118-105-1(5)
1K161-427
1K161-428
1K161-429
1K161-430
1K161-431
1K161-432
1K161-433
x0-n(5)
1K161-426(5)
1C999-563(1)
TA-0018
20x70
1B002-456(1)
1K110-944(1)
1K110-706(1)

Fig. 2

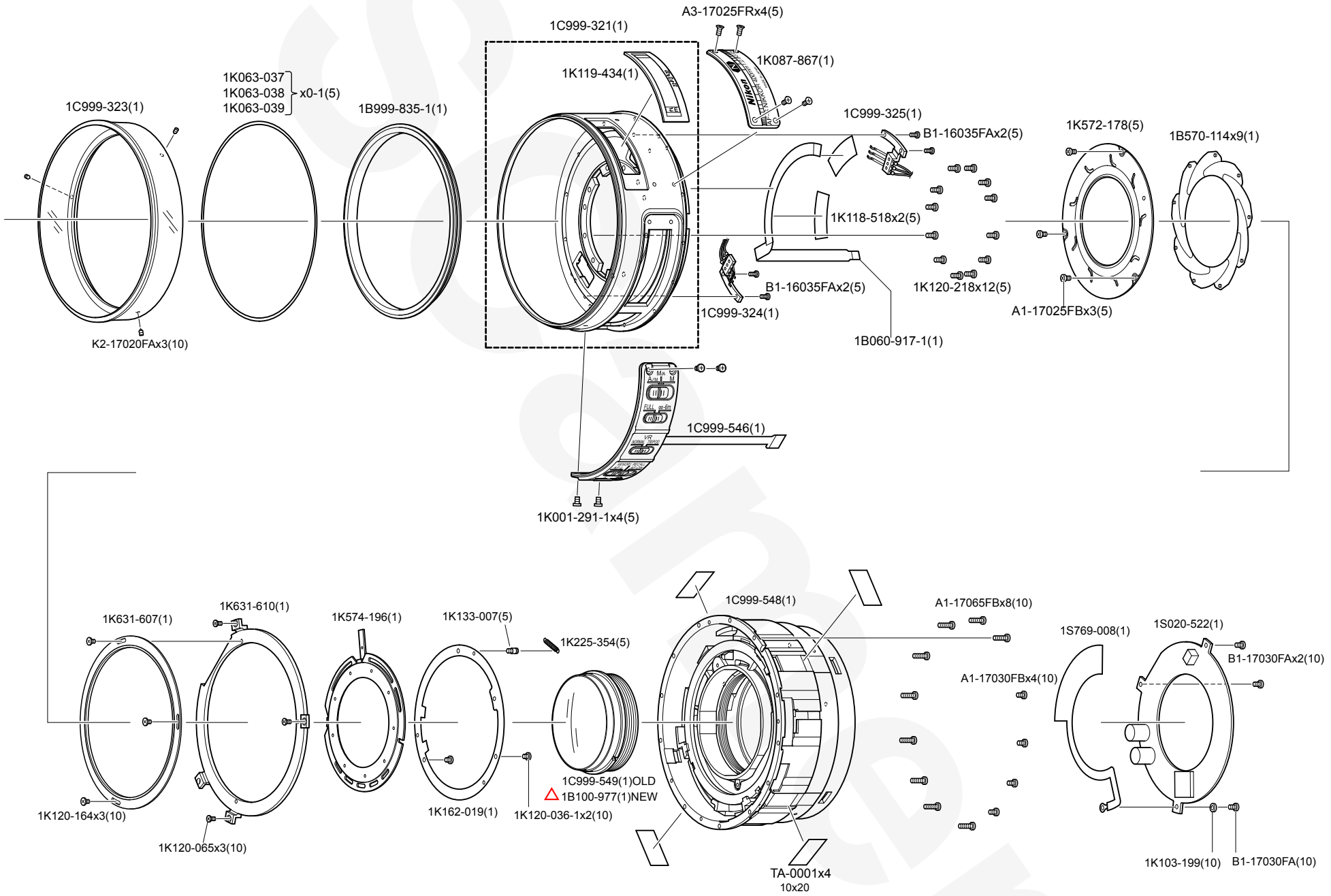
A3-17025FRx4(5)
1C999-321(1)
1K087-867(1)
1K119-434(1)
1K063-037
1K063-038
1K063-039
x0-1(5)
1C999-323(1)
1B999-835-1(1)
1C999-325(1)
B1-16035FAx2(5)
1K572-178(5)
1B570-114x9(1)
1K118-518x2(5)
B1-16035FAx2(5)
1K120-218x12(5)
A1-17025FBx3(5)
1C999-324(1)
1B060-917-1(1)
K2-17020FAx3(10)
1C999-546(1)
1K001-291-1x4(5)
1K631-607(1)
1K631-610(1)
1K574-196(1)
1K133-007(5)
1K225-354(5)
1C999-548(1)
A1-17065FBx8(10)
1S769-008(1)
1S020-522(1)
B1-17030FAx2(10)
A1-17030FBx4(10)
1C999-549(1)OLD
△1B100-977(1)NEW
1K120-164x3(10)
1K120-065x3(10)
1K162-019(1)
1K120-036-1x2(10)
TA-0001x4
10x20
1K103-199(10)
B1-17030FA(10)

Fig. 3

AF-S VR400/F2.8G | JAA52851-R.3724.A

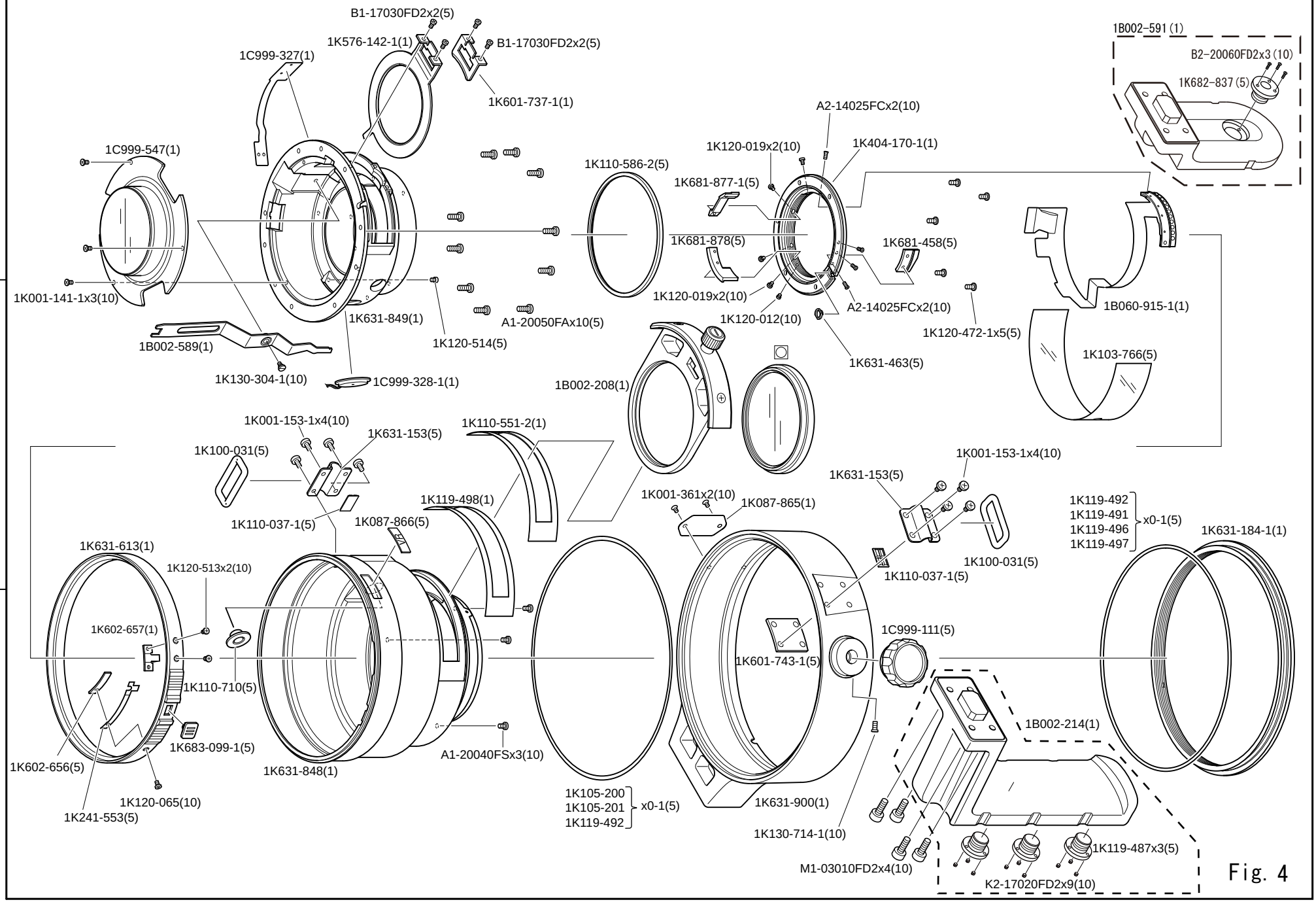

Fig. 4

Parts List

AF-S VR400/F2.8G

JAA52851-R.3724.A

	Part Number Part Code	Barcode (Part Code)	部品名 Part Name	Pcs,/ Unit	fig No.	Main Assembly	Q'ty/ Order	Remarks
*	1B002-208 1B002-208		ﾌｨﾙﾀｰﾎﾙﾀﾞｰ部組 FILTER HOLDER UNIT	1	4		1	
*	1B002-214 1B002-214		三脚座部組 TRIPOD SOCKET UNIT	1	4		1	
*	1B002-456 1B002-456		ｳｪｰﾌﾞﾜｯｼｬｰ部組 WAVE WASHER UNIT	1	2		1	
	1B002-589 1B002-589		ｼｰｿｰﾚﾊﾞｰ部組 SEESAW LEVER UNIT	1	4		5	
	1B002-591 1B002-591		一脚座部組 TRIPOD SOCKET UNIT	1	4		1	
△ *	1B060-740 1B060-740		SWM部組 SWM UNIT	1	2		1	RP08052 NEW
*	1B060-914-1 1B060-914-1		GMR部組 RoHS GMR UNIT	1	2		1	
*	1B060-915-1 1B060-915-1		接点FPC部組 RoHS CONTACT FPC UNIT	1	4		1	
*	1B060-917 1B060-917		SWM電源FPC部組 SWM POWER FPC UNIT	1	3		1	
△	1B100-977 1B100-977		3群部組 3rd LENS UNIT	1	3		1	RP08052 NEW
*	1B570-114 1B570-114		羽根部組 BLADE UNIT	1	3		10	
*	1B999-835-1 1B999-835		調整環部組 ADJUSTMENT RING UNIT	1	3		1	
*	1C999-111 1C999-111		ｸﾗﾝﾌﾟﾉﾌﾞ部組 CLANK KNOB UNIT	1	4		1	
	1C999-319-1 1C999-319-1		AFﾛｯｸ FPC部組 AF LOCK FPC UNIT	1	2		1	RP08029
*	1C999-321 1C999-321		SWM固定筒部組 SWM FIXED TUBE UNIT	1	3		1	
*	1C999-323 1C999-323		透明環部組 TRANSPARENT RING UNIT	1	3		1	
*	1C999-324 1C999-324		電源ﾌﾞﾗｼ部組1 POWER SUPPLY BRUSH UNIT 1	1	3		1	
*	1C999-325 1C999-325		電源ﾌﾞﾗｼ部組2 POWER SUPPLY BRUSH UNIT 2	1	3		1	
*	1C999-327 1C999-327		ﾒﾓﾘｾｯﾄFPC部組 MEMORY SET FPC UNIT	1	4		1	

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	Part Number Part Code	Barcode (Part Code)	部品名 Part Name	Pcs,/ Unit	fig No.	Main Assembly	Q'ty/ Order	Remarks
*	1C999-328-1 1C999-328-1		ﾌﾞｻﾞｰｶﾊﾞｰ部組 RoHS COVER BUZZER UNIT RoHS	1	4		1	
	1C999-544 1C999-544		固定筒部組 FIXED TUBE UNIT	1	2		1	
△	1C999-545 1C999-545		SWM部組 SWM UNIT	1	2		1	RP08052 OLD
	1C999-546 1C999-546		切替SW部組 CHANGE SW UNIT	1	3		1	
	1C999-547 1C999-547		4群部組 4th LENS UNIT	1	4		1	
	1C999-548 1C999-548		VRﾕﾆｯﾄ部組 VR UNIT	1	3		1	
△	1C999-549 1C999-549		3群部組 3rd LENS UNIT	1	3		1	RP08052 OLD
	1C999-562 1C999-562		1.5群部組 1.5 LENS UNIT	1	1		1	
	1C999-563 1C999-563		MF環部組 MANUAL FOCUS RING UNIT	1	2		1	
	1C999-570 1C999-570		ﾌﾞﾗｼ部組 BRASH UNIT	1	2		1	
*	1K001-141-1 1K001-141		SCREW SCREW	3	4		10	
*	1K001-151-2 1K001-151-2		SCREW SCREW	12	2		10	
*	1K001-153-1 1K001-153		SCREW SCREW	8	4		10	
*	1K001-291-1 1K001-291		SCREW SCREW	4	3		10	
	1K001-361 1K001-361		SCREW SCREW	2	4		10	
*	1K063-037 1K063-037		ﾜｯｼｬｰ T=0.1 ADJUSTMENT WASHER T=0.1	0-1	3		10	
*	1K063-038 1K063-038		ﾜｯｼｬｰ T=0.2 ADJUSTMENT WASHER T=0.2	0-1	3		10	

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Part Number Part Code	Barcode (Part Code)	部品名 Part Name	Pcs,/ Unit	fig No.	Main Assembly	Q'ty/ Order	Remarks
* 1K001-151-2 1K001-151-2		SCREW SCREW	12	2		10	
* 1K001-153-1 1K001-153		SCREW SCREW	8	4		10	
* 1K001-291-1 1K001-291		SCREW SCREW	4	3		10	
1K001-361 1K001-361		SCREW SCREW	2	4		10	
* 1K063-037 1K063-037		ﾜｯｼｬｰ T=0.1 ADJUSTMENT WASHER T=0.1	0-1	3		10	
* 1K063-038 1K063-038		ﾜｯｼｬｰ T=0.2 ADJUSTMENT WASHER T=0.2	0-1	3		10	
* 1K063-039 1K063-039		ﾜｯｼｬｰ T=0.5 ADJUSTMENT WASHER T=0.5	0-1	3		10	
1K087-865 1K087-865		ナノ銘板 NANO NAME PLATE	1	4		1	
1K087-866 1K087-866		VR銘版 VR NAME PLATE	1	4		5	
1K087-867 1K087-867		銘板　製品番号刻印 NAME PLATE WITH S/N	1	3		1	
* 1K100-031 1K100-031		吊り環 EYELET	2	4		5	
* 1K103-199 1K103-199		ﾜｯｼｬｰ WASHER	1	3		10	
1K103-766 1K103-766		ｶﾌﾟﾄﾝﾃｰﾌﾟ TAPE	1	4		5	
1K105-200 1K105-200		ﾃﾌﾛﾝｼｰﾄ TEFRON SHEET	0-1	4		1	
1K105-201 1K105-201		ﾃﾌﾛﾝｼｰﾄ TEFRON SHEET	0-1	4		1	
* 1K110-037-1 1K110-037		吊り環台座ｺﾞﾑ RUBBER	2	4		5	
* 1K110-551-2 1K110-551		防滴ｺﾞﾑ RUBBER	1	4		1	

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Part Number Part Code	Barcode (Part Code)	部品名 Part Name	Pcs,/ Unit	fig No.	Main Assembly	Q'ty/ Order	Remarks
* 1K110-553-1 1K110-553		ｺﾞﾑﾘﾝｸﾞ RUBBER RING	1	1		1	
* 1K110-586-2 1K110-586		防滴ｺﾞﾑ RUBBER RING	1	4		5	
* 1K110-706 1K110-706		ｺﾞﾑﾘﾝｸﾞ RUBBER RING	1	2		1	
1K110-710 1K110-710		ﾒﾓﾘｾｯﾄﾎﾞﾀﾝ MEMORY SET BUTTON	1	4		5	
1K110-943 1K110-943		防滴ｺﾞﾑ RUBBER	1	1		1	
1K110-944 1K110-944		ｺﾞﾑﾘﾝｸﾞ RUBBER RING	1	2		10	
* 1K118-105-1 1K118-105-1		ﾎﾟﾘｴｽﾃﾙﾃｰﾌﾟ TAPE	1	2		5	
* 1K118-518 1K118-518		ｶﾌﾟﾄﾝﾃｰﾌﾟ TAPE	2	3		5	
* 1K118-527-1 1K118-527		先端保護ｺﾞﾑ RUBBER RING	1	1		1	
* 1K119-434 1K119-434		窓 WINDOW	1	3	1C999-321	1	
* 1K119-487 1K119-487		三脚座ｸﾗﾝﾌﾟ TRIPOD RING CLAMP	3	4	1B002-214	5	
* 1K119-491 1K119-491		ﾃﾌﾛﾝｼｰﾄ T=0.4 TEFRON SHEET T=0.4	0-1	4		1	
* 1K119-492 1K119-492		ﾃﾌﾛﾝｼｰﾄ T=0.4 TEFRON SHEET	0-1	4		1	
* 1K119-496 1K119-496		ﾃﾌﾛﾝｼｰﾄ T=0.3 TEFRON SHEET T=0.3	0-1	4		1	
* 1K119-497 1K119-497		ﾃﾌﾛﾝｼｰﾄ T=0.5 TEFRON SHEET T=0.5	0-1	4		1	
* 1K119-498 1K119-498		防塵ｺﾞﾑﾃｰﾌﾟ TAPE	1	4		5	
* 1K120-012 1K120-012		SCREW SCREW	1	4		10	

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Part Number Part Code	Barcode (Part Code)	部品名 Part Name	Pcs,/ Unit	fig No.	Main Assembly	Q'ty/ Order	Remarks
* 1K120-019 1K120-019		SCREW SCREW	4	4		10	
* 1K120-036-1 1K120-036		SCREW SCREW	2	3		10	
* 1K120-065 1K120-065		SCREW SCREW	4	3,4		10	
* 1K120-164 1K120-164		SCREW SCREW	3	3		10	
* 1K120-218 1K120-218		SCREW SCREW	12	3		10	
* 1K120-417-2 1K120-417-2		SCREW SCREW	3	2		10	
* 1K120-472-1 1K120-472		SCREW SCREW	5	4		10	
* 1K120-513 1K120-513		SCREW SCREW	2	4		10	
1K120-514 1K120-514		SCREW SCREW	1	4		10	
* 1K130-304-1 1K130-304		SCREW SCREW	1	4		10	
* 1K130-714-1 1K130-714		SCREW SCREW	1	4		10	
* 1K133-007 1K133-007		SCREW SCREW	1	3		5	
* 1K161-426 1K161-426		ﾜｯｼｬｰ T=0.04 ADJUSTMENT WASHER T=0.04	1	2		5	
* 1K161-427 1K161-427		ﾜｯｼｬｰ T=0.05 ADJUSTMENT WASHER T=0.05	0-n	2		5	
* 1K161-428 1K161-428		ﾜｯｼｬｰ T=0.06 ADJUSTMENT WASHER T=0.06	0-n	2		5	
* 1K161-429 1K161-429		ﾜｯｼｬｰ T=0.07 ADJUSTMENT WASHER T=0.07	0-n	2		5	
* 1K161-430 1K161-430		ﾜｯｼｬｰ T=0.08 ADJUSTMENT WASHER T=0.08	0-n	2		5	

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Part Number Part Code	Barcode (Part Code)	部品名 Part Name	Pcs,/ Unit	fig No.	Main Assembly	Q'ty/ Order	Remarks
* 1K161-431 1K161-431		ﾜｯｼｬｰ T=0.09 ADJUSTMENT WASHER T=0.09	0-n	2		5	
* 1K161-432 1K161-432		ﾜｯｼｬｰ T=0.10 ADJUSTMENTWASHER T=0.10	0-n	2		5	
* 1K161-433 1K161-433		ﾜｯｼｬｰ T=0.03 ADJUSTMENT WASHER T=0.03	0-n	2		5	
* 1K162-019 1K162-019		矢車押さえ APERTURE ACTION RETAINER	1	3		1	
* 1K208-180 1K208-180		AFﾛｯｸｺﾞﾑ AF LOCK RUBBER	4	2		5	
* 1K225-354 1K225-354		引っ張りﾊﾞﾈ SPRING	1	3		5	
* 1K233-096 1K233-096		SWMｶﾞﾀ取りﾊﾞﾈ SWM FIXED SPRING	1	2		5	
* 1K241-553 1K241-553		ﾛｯｸ板ﾊﾞﾈ LOCK PLATE SPRING	1	4		5	
* 1K246-116-1 1K246-116		ｳｪｰﾌﾞﾜｯｼｬｰ部組 WAVE WASHER	1	2		5	
* 1K404-170-1 1K404-170		ﾊﾞﾖﾈｯﾄﾏｳﾝﾄ BAYONET MOUNT	1	4		1	
1K501-203 1K501-203		ﾚﾝｽﾞ室 LENS HOUSING	1	1		1	
1K515-264 1K515-264		G7G8間隔環 G7G8 TUBE	1	2		5	
1K515-266 1K515-266		押さえ環 RETAINER RING	1	1		1	
1K521-405 1K521-405		押さえ環 RETAINER RING	1	1		1	
1K521-406 1K521-406		押さえ環 RETAINER RING	1	1		1	
1K521-407 1K521-407		押さえ環 RETAINER RING	1	2		5	
1K521-408 1K521-408		押さえ環 RETAINER RING	1	1		1	

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Part Number Part Code	Barcode (Part Code)	部品名 Part Name	Pcs,/ Unit	fig No.	Main Assembly	Q'ty/ Order	Remarks
* 1K572-178 1K572-178		矢車 APERTURE ACTION PLATE	1	3		5	
* 1K574-196 1K574-196		ﾊﾁﾉｽ BLADE MOUNTING UNIT	1	3		1	
* 1K576-142-1 1K576-142		固定絞り板 FIXED APERTURE PLATE	1	4		1	
* 1K601-737-1 1K601-737		ﾌｨﾙﾀ保持版 FILTER HOLD PLATE	1	4		1	
* 1K601-743-1 1K601-743		吊り環内板 EYELET INNER PLATE	1	4		5	
* 1K602-656 1K602-656		曲げ板 BENT PLATE	1	4		5	
* 1K602-657 1K602-657		ﾛｯｸﾘﾝｸﾞ連動ｷｰ CONNECTING KEY	1	4		5	
* 1K612-058 1K612-058		FPC押さえ板 FPC RETAINER PLATE	1	2		5	
* 1K631-138-1 1K631-138		AFﾛｯｸ環 AF LOCK RING	1	2		1	
* 1K631-153 1K631-153		吊り環板 EYELET RING PLATE	1	4		1	
* 1K631-184-1 1K631-184		三脚座押さえ環 TRIPOD SOCKET RETAINER PLATE	1	4		1	
* 1K631-463 1K631-463		2幅ｺﾏ DOUBLE GROOVE BAR	1	4		5	
* 1K631-607 1K631-607		羽根室 BLADE HOUSING	1	3		1	
* 1K631-610 1K631-610		丸環 RING	1	3		1	
* 1K631-613 1K631-613		VR on-off切替ﾘﾝｸﾞ VR ON-OFF CHANGE RING	1	4		1	
1K631-848 1K631-848		外固定筒 EXTERIOR FIXED TUBE	1	4		1	
1K631-849 1K631-849		固定筒 FIXED TUBE	1	4		1	

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Part Number Part Code	Barcode (Part Code)	部品名 Part Name	Pcs,/ Unit	fig No.	Main Assembly	Q'ty/ Order	Remarks
1K631-850 1K631-850		前側固定筒 FRONT FIXED TUBE	1	2		1	
1K631-898 1K631-898		ﾌｰﾄﾞ取付ﾘﾝｸﾞ FIXED FOR FILTER RING	1	1		1	
1K631-900 1K631-900		三脚環 TRIPOD RING	1	4		1	
1K631-901 1K631-901		金環 GOLD RING	1	1		1	
* 1K641-335 1K641-335		差動ﾛｰﾗ DIFFERENTION ROLLER	3	2		5	
* 1K681-458 1K681-458		曲げ板 BENT PLATE	1	4		5	
* 1K681-877-1 1K681-877		3.1ﾚﾊﾞｰ保護ｺﾏ 3.1 PROTECTOR PIECE	1	4		1	
* 1K681-878 1K681-878		θ 3ｺﾏ(f0信号) PIECE(f0 SIGNAL)	1	4		5	
* 1K682-837 1K682-837		1脚座ﾅｯﾄ	1	4	1B002-591	1	
* 1K683-099-1 1K683-099		ﾛｯｸﾉﾌﾞ LOCK KNOB	1	4		5	
1K683-728 1K683-728		距離目盛 FOCUS INDEX	1	2		5	
1S020-522 1S020-522		ﾒｲﾝ基盤部組 MAIN PCB UNIT	1	3		1	
1S020-527 1S020-527		ｼﾞｬｲﾛ基板部組 GYRO PCB UNIT	1	2		1	
* 1S769-008 1S769-008		ｼｰﾙﾄﾞ SHIELD PLATE	1	3		1	
1S813-257 1S813-257		ﾋﾞﾆｰﾙ電線 VINYL ELECTRIC WIRE	1	1		1	
* A1-17025FB A1-17025FB		SCREW SCREW	3	3		10	
* A1-17030FB A1-17030FB		SCREW SCREW	4	3		10	

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Part Number Part Code	Barcode (Part Code)	部品名 Part Name	Pcs,/ Unit	fig No.	Main Assembly	Q'ty/ Order	Remarks
* A1-17040FA A1-17040FA		SCREW SCREW	2	2		10	
* A1-17065FB A1-17065FB		SCREW SCREW	8	3		5	
* A1-20040FS A1-20040FS		SCREW SCREW	3	4		10	
* A1-20050FA A1-20050FA		SCREW SCREW	10	4		10	
* A2-14025FC A2-14025FC		SCREW SCREW	4	4		10	
A3-17025FR A3-17025FR		SCREW SCREW	4	3		5	
* B1-16035FA B1-16035FA		SCREW SCREW	4	3		5	
* B1-17020FA B1-17020FA		SCREW SCREW	2	2		10	
* B1-17030FA B1-17030FA		SCREW SCREW	3	3		10	
* B1-17030FD2 B1-17030FD2		SCREW SCREW	12	1&4		10	
* B2-14025FB B2-14025FB		SCREW SCREW	2	2		10	
B2-20060FD2 B2-20060FD2		SCREW SCREW	3	4	1B002-591	10	
K2-17016FD2 K2-17016FD2		SCREW SCREW	3	1		10	
* K2-17020FA K2-17020FA		SCREW SCREW	3	3		10	
K2-17020FD2 K2-17020FD2		SCREW SCREW	9	4	1B002-214	10	
K2-20030FD2 K2-20030FD2		SCREW SCREW	4	2		10	
M1-03010FD2 M1-03010FD2		SCREW SCREW	4	4		10	